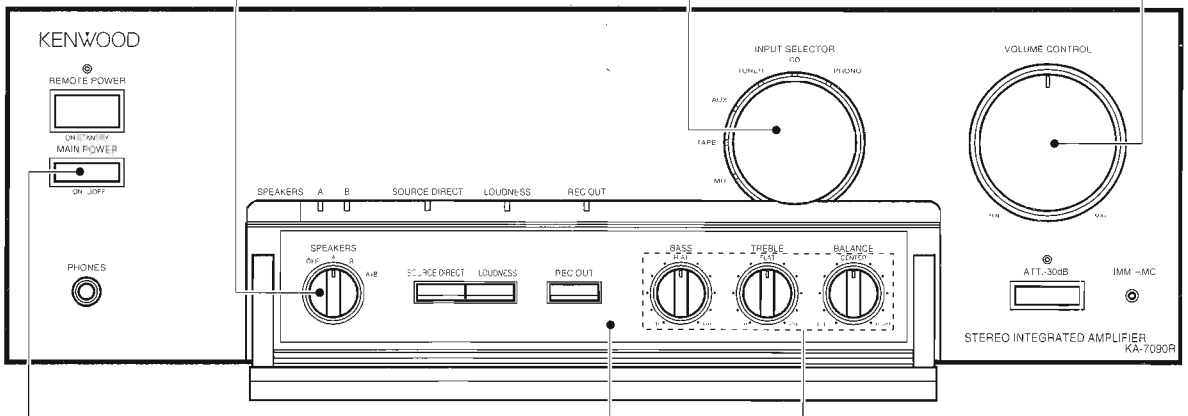
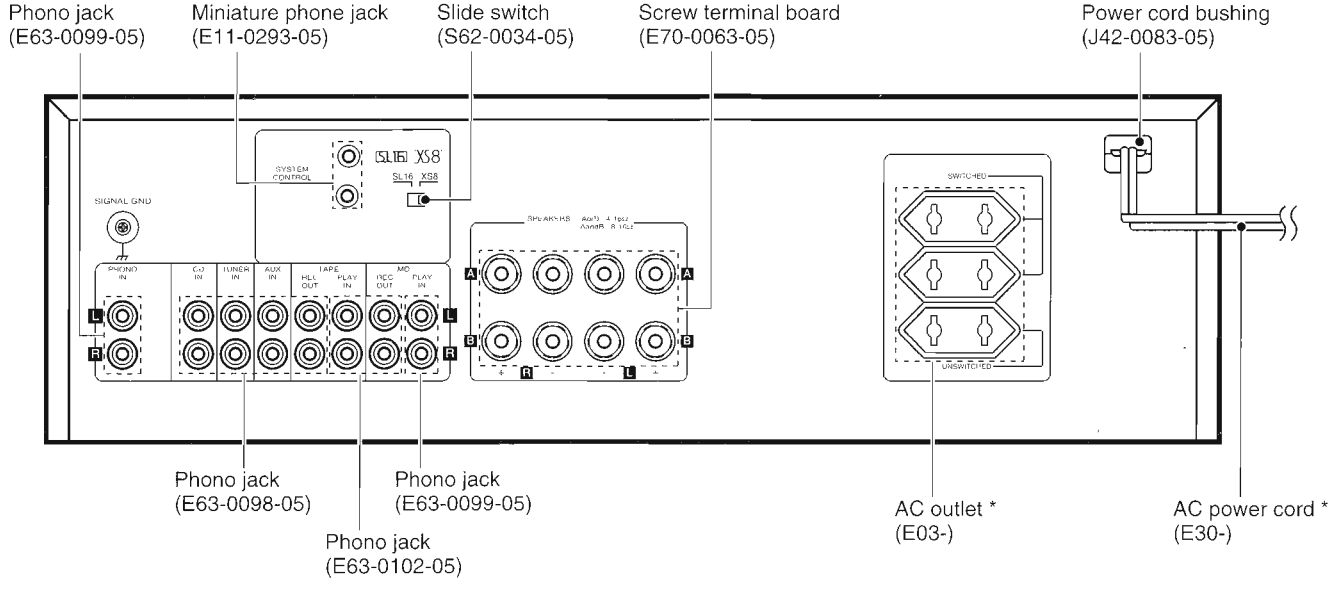
STEREO INTEGRATED AMPLIFIER

KA-7090R

SERVICE MANUAL

KENWOOD





*** Refer to parts list on page 26.**

KA-7090R

CONTENTS / ACCESSORIES

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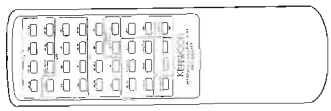
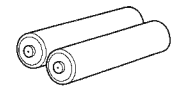
Accessories

Remote control unit .....(1)
(A70-1079-05)



Batteries .....(2)

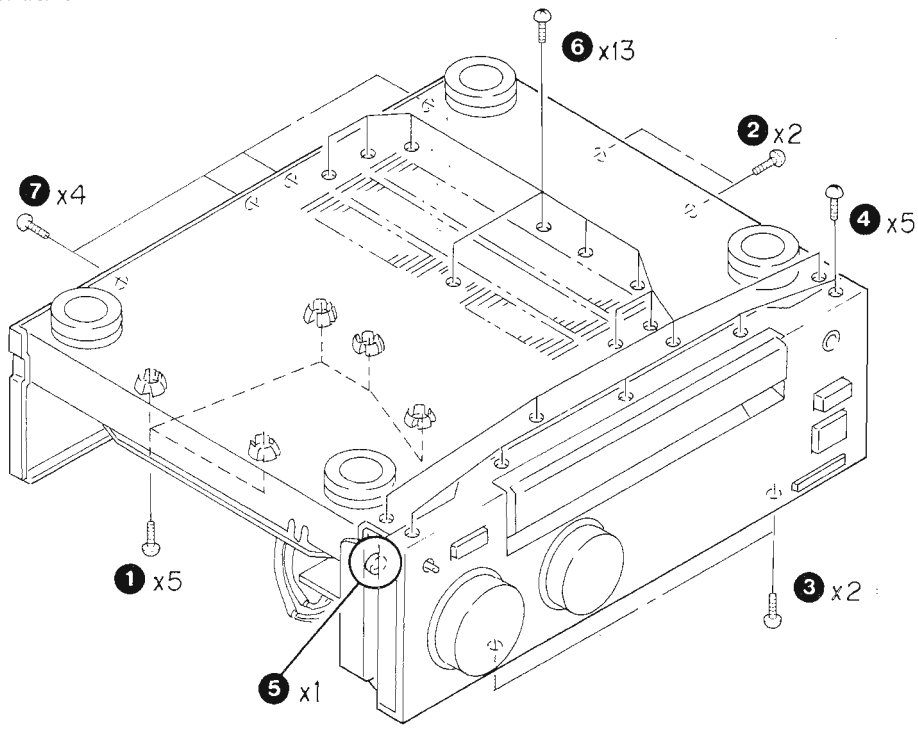


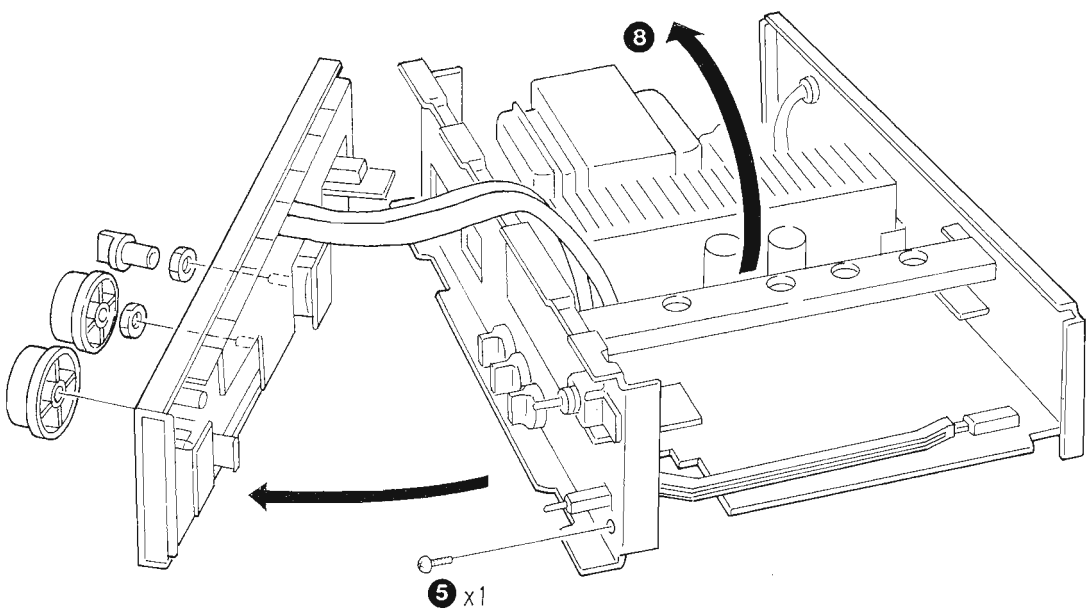
Battery cover (A09-0170-08)

DISASSEMBLY FOR REPAIR

HOW TO REPLACE POWER TRANSISTOR

1. Remove 5 screws (❼)fixing audio pcb (X09).
2. Remove left side screws (❷).
3. Remove panel top screws (❸), panel bottom screws(❹) and fram screw(❺).
4. Remove bottom screws(❻), rear screws(❼) and bottom plate.
5. Lift unit to arrow direction(❽). (Power transformer is bottom side)
6. Replace power transistors.





KA-7090R

CIRCUIT DESCRIPTION

1. FUNCTION

(1) FEATURE

* K's is Japanese market only.

	COMPO(KA-7090R)	K's *
AUDIO INPUT	TAPE, MD, CD, AUX, TUNER, PHONO	
REC OUT	TAPE→MD, MD→TAPE CD, AUX, TUNER, PHONO	×
DIRECT	SOURCE DIRECT	SOURCE DIRECT CD DIRECT
LOUDNESS	○	○
MD/MONITOR	×	○
REMOCON	○	○
SYSTEM CONTROL	○ (8/16)	○ (16)
MOTOR VOLUME	○	○
HEADPHONE	○	○
SPEAKER	A / B / A+B / OFF	A / B / A+B / OFF
BACK UP	○	○

2. MODEL CONDITION

			PORT2 (SERIAL／MODEL)	
			H	L
PORT1 (MODEL)	H	COMPO (KA-7090R)	SERIAL 8 bit	SERIAL 16 bit
	L	K's	KAF-7002	KAF-5002

3. INITIALIZING FUNCTION

3-1. Initializing Operation

- Insert the AC power (set the POWER key to ON) for initialization while pressing the ON/STAND_BY key even if the system is in the backup state.
- After the microcomputer is reset, set the port, modes, and register, then check each key.
  - ∗ If the ON/STAND_BY key is pressed, perform the RAM ALL CLEAR operation for initialization.
  - ∗ If the ON/STAND_BY key is not pressed, check whether the system is in the backup state.
  - ∗ Pull out the AC power (set the POWER key to OFF) to destroy the backup data while pressing the ON/STAND_BY key.

3-2. INITIAL STAGE

NO	FUNCTION	MODEL		
		COMPO (KA-7090R)	KAF-7002	KAF-5002
1	ON/STAND-BY	SYSTEM OFF	SYSTEM OFF	SYSTEM OFF
2	INPUT SELECTOR	TUNER	TUNER	TUNER
3	REC OUT	REC MODE OFF (OFF)		
4	LOUDNESS	OFF	OFF	OFF
6	DIRECT		DIRECT OFF	DIRECT OFF
	SOURCE. DIR	OFF		
7	MD/MONITOR		OFF	OFF
9	MUTING	OFF	OFF	OFF

4. BACK UP DATA

WHEN STAND-BY

NO	DESIGNATION	MODEL		
		COMPO (KA-7090R)	KAF-7002	KAF-5002
2	INPUT SELECTOR	SELECTOR CONDITION	SELECTOR CONDITION	SELECTOR CONDITION
3	REC OUT	REC OUT POS		
4	LOUDNESS	ON/OFF CONDITION	ON/OFF CONDITION	ON/OFF CONDITION
6	DIRECT		DIRECT CONDITION	DIRECT CONDITION
	SOURCE. DIR	S. DIR CONDITION		
7	MD/MONITOR		ON/OFF CONDITION	ON/OFF CONDITION
9	MUTING	MUTE CONDITION	MUTE CONDITION	MUTE CONDITION

CIRCUIT DESCRIPTION

5. TEST MODE

5-1. Test Mode using Main Unit's Keys

(1) Setting the test mode
- Turn on the power while pressing the "LOUDNESS" key.

(2) Canceling the test mode
- To initialize the system and cancel the test mode, turn off the power.

(3) Contents of test mode
- The muting during mode selection is not controlled in the test mode. However, the operation when the power is turned on is the same as for the normal operation.
- The speaker protection operation is also the same as for the normal operation.

(4) Automatic POWER ON
- The POWER ON state is entered for model discrimination whenever the power is turned on while pressing the "LOUDNESS" key. All the functions are then initialized and activated in the all-lighting mode.
- In the all-lighting mode, the selector display LED lights sequentially. For KAF-7002/5002, the SOURCE DIRECT and CD DIRECT display LEDs light alternately. For KA-7090R, the SOURCE DIRECT display LED lights. The SP A and B display LEDs do not light. All other LEDs light.
- The all-lighting mode is canceled when any of the main unit's keys is pressed. The normal display obtained when the selector is set to TUNER then appears.

(5) Special operation
- "LOUDNESS" key

  (a) When this key is pressed, the LOUDNESS display LED lights and the electric volume turns up for 16 seconds. After 16 seconds, the electric volume stops and the display LED goes off.

  (b) When this key is pressed during operation or after operation in step (a), the LOUDNESS display LED lights and the electric volume turns down for 16 seconds. After 16 seconds, the electric volume stops and the display LED goes off.

  (c) When this key is pressed during operation in step (b), the LOUDNESS display LED goes off and the electric volume stops.

  (d) The operation in step (a) is carried out when this key is pressed after operation in step (c). After that, the operation in steps (a) to (c) is repeated every time this key is pressed. The operation is not canceled even if another key is pressed while the electric volume turns up and down.
- "SPEAKER A + B"

  When the switch is set to this position, the SPEAKER A + B LED (for only the KA-7090R) lights and the audio muting is turned on. When the switch is set to another position, the LED goes off and the audio muting is turned off.
- "MD MONITOR" key (for only KAF-7002/5002)

  When this key is pressed, the MUTE display LED lights and the audio muting is turned on. When this key is pressed again, the audio muting is turned off and the display LED goes off.
- "ATT. -30dB" key (for only KA-7090R)

  When this key is pressed, the ATT. LED lights and the ATT. -30dB is turned on during normal operation. The REC muting is turned on while the REC OUT mode is set to ON. When this key is pressed again, the ATT. or REC muting is canceled and the ATT. LED goes off.
- "REC OUT" key (for only KA-7090R)

  When this key is pressed, the REC OUT LED lights and the REC OUT mode is set to ON. The operation is not canceled until this key is pressed again. The REC muting is canceled if it is on when the operation is canceled.
- "8/16-bit selector switch" (for only KA-7090R)

  The system enters the all-lighting mode if this switch is set to the 8-bit position when the ATT. key is on after the all-lighting mode is canceled. The serial POWER ON code is output at that time (code "25H" is output when the test mode is activated in the 8-bit position, and code "0800" is output when it is activated in the 16-bit position). The all-lighting mode is canceled when this switch is set to the 16-bit position again or when the ATT. key is pressed. The normal display then appears.

5-2. Serial Test Mode

(1) Setting the test mode
- The serial test mode is entered if a serial "71H" code is received only when the KA-7090R is in the 8-bit mode. After that, only the 16-bit mode is accepted. In other cases, the serial test mode is entered when a serial "C27FH" code is received.

(2) Canceling the test mode
- The serial test mode is canceled when a "C27FH" code is received. In this case, the system is not initialized. The serial code also remains set to the 16-bit position.
- When the AC power (main power) is turned off, the serial test mode is canceled and the system is initialized.

(3) Contents of test mode
- The serial code for a test shown in the attached list is analyzed for processing.
- In the test mode, no mute signal is output to shorten the input/output selection time during measurement. However, the operation when the power is turned on is the same as for the normal operation.
- The speaker protection operation is also the same as for the normal operation.- The code input in the test mode by serial communication is validated irrespective of the display mode.

CIRCUIT DESCRIPTION

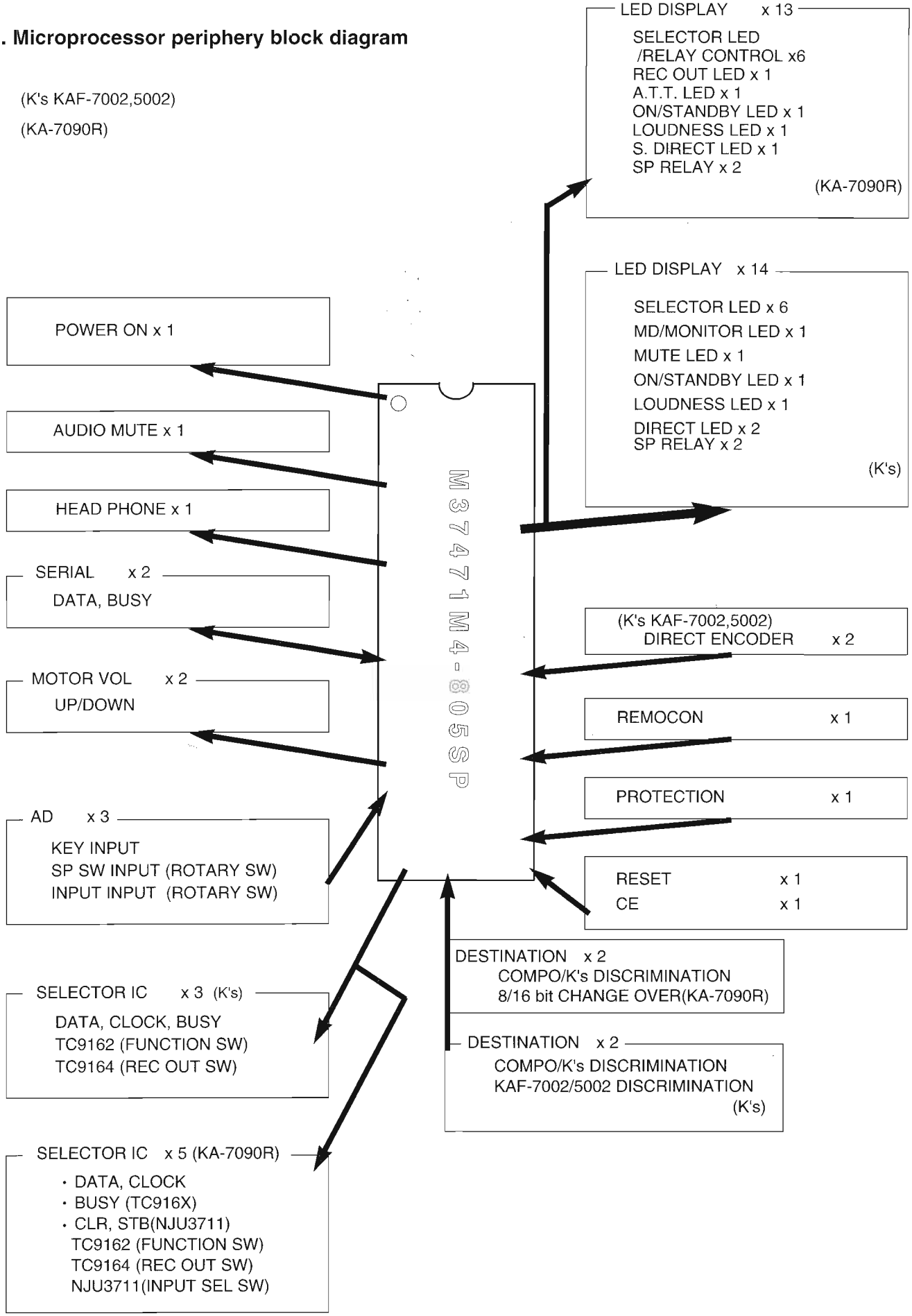
- The all-lighting mode is canceled using an all-lighting cancel code. After cancellation, the normal display appears.
- In the all-lighting mode, the selector display LED lights sequentially. For KAF-7002/5002, the SOURCE DIRECT and CD DIRECT display LEDs light alternately. For KA-7090R, the SOURCE DIRECT LED lights. The SPEAKER LED does not light. All other LEDs light.
- The REC OUT selector is operated by inputting the code of the selector after a REC MODE ON code is input (for only KA-7090R).
- The main unit' s keys can be pressed even in the serial test mode. However, the operation is not guaranteed in this case.
- The operation when the code having a function not contained in the corresponding model is input is not guaranteed.
- The REC muting is canceled by MUTE ALL OFF.

CIRCUIT DESCRIPTION

6. Microprocessor periphery block diagram

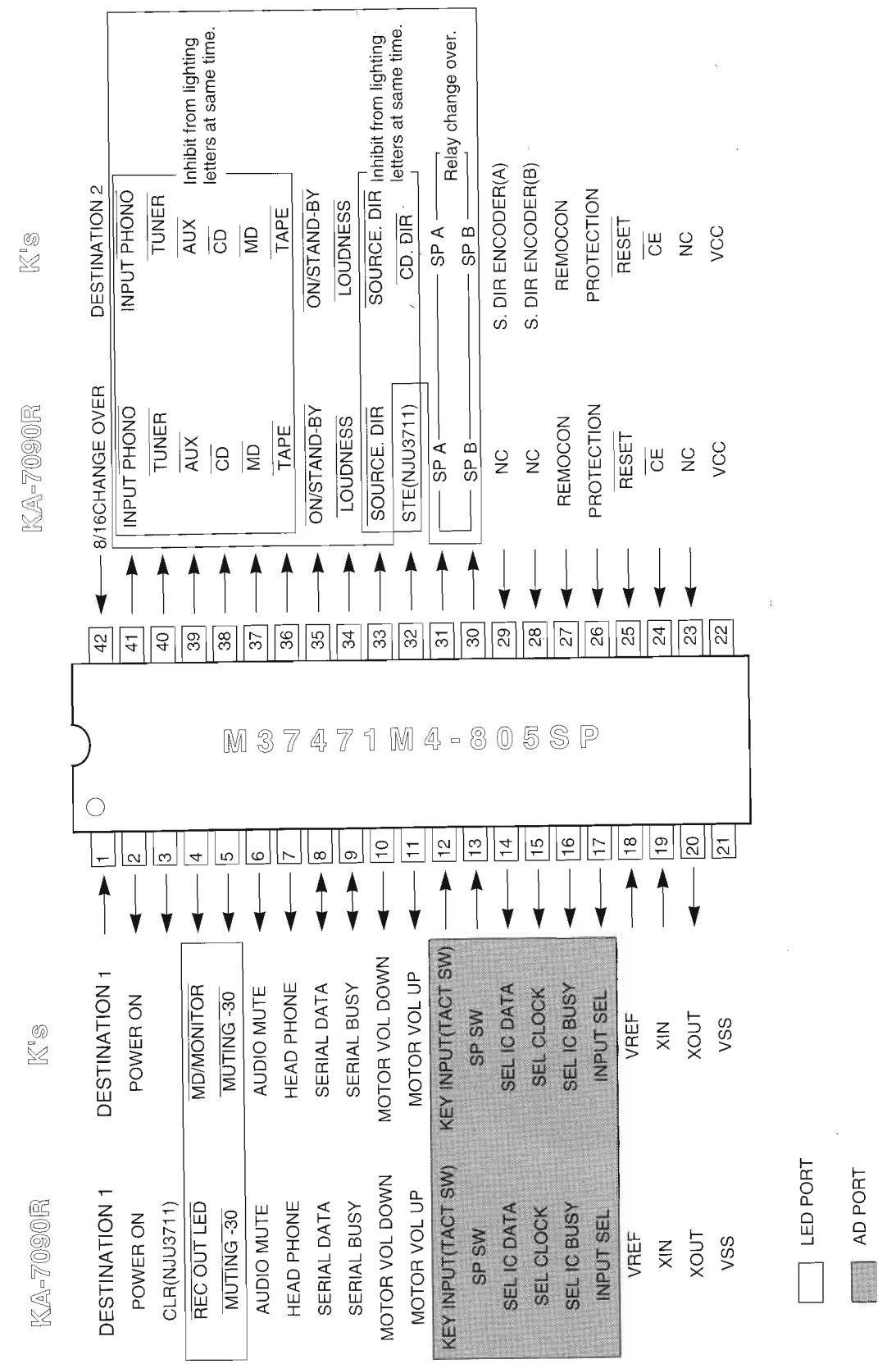
(K's KAF-7002,5002)

(KA-7090R)



CIRCUIT DESCRIPTION

6-1. Microprocessor pin connection



CIRCUIT DESCRIPTION

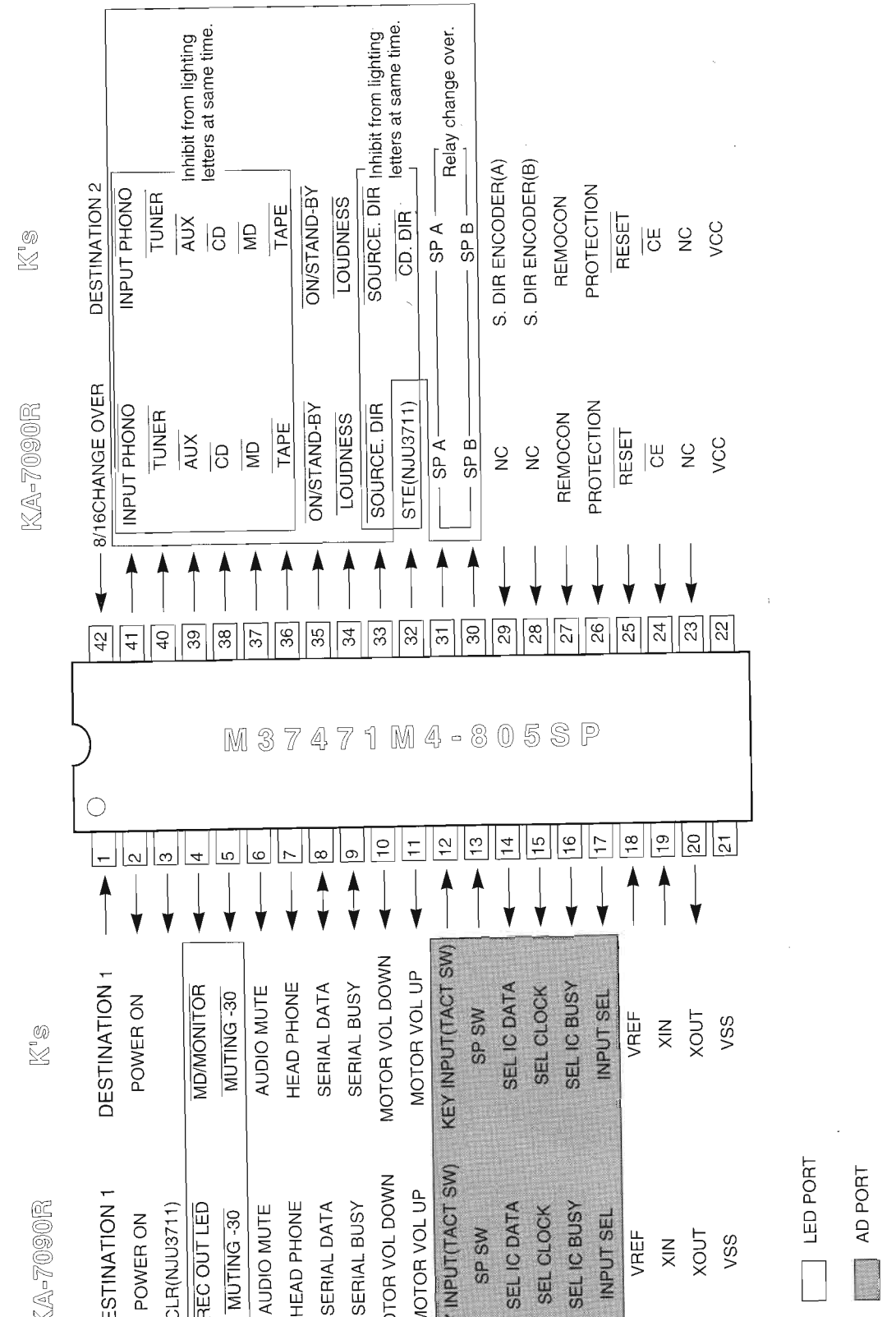
16bit serial test code (C2XXH)

TYPE / FUNC	AMP 0	1	2	3	4	5	6	7
0	POWER OFF	CD DIRECT OFF						
1	POWER ON	CD DIRECT ON						
2	PHONO				MUTING OFF (-30dB)			MD MONITOR ON
3	CD				MUTING ON (-30dB)			MD MONITOR OFF
4	TUNER	SOURCE DIRECT OFF	MOTOR VOL UP					REC MODE ON
5		SOURCE DIRECT ON	MOTOR VOL DOWN					REC MODE OFF
6	TAPE2 (TAPE B)		MOTOR VOL STOP					REC OUT OFF POSITION
7	AUX						MD (INPUT)	
8		LOUDNESS OFF						
9		LOUDNESS ON						
A								
B							REC MUTE ON	ALL LEDS OFF
C								ALL LEDS ON
D	MUTE ON							AMP INITIAL
E								AMP SERIAL TEST OFF
F	MUTE ALL OFF							AMP SERIAL TEST ON

: Sending code : Receiving code

CIRCUIT DESCRIPTION

6-1. Microprocessor pin connection



CIRCUIT DESCRIPTION

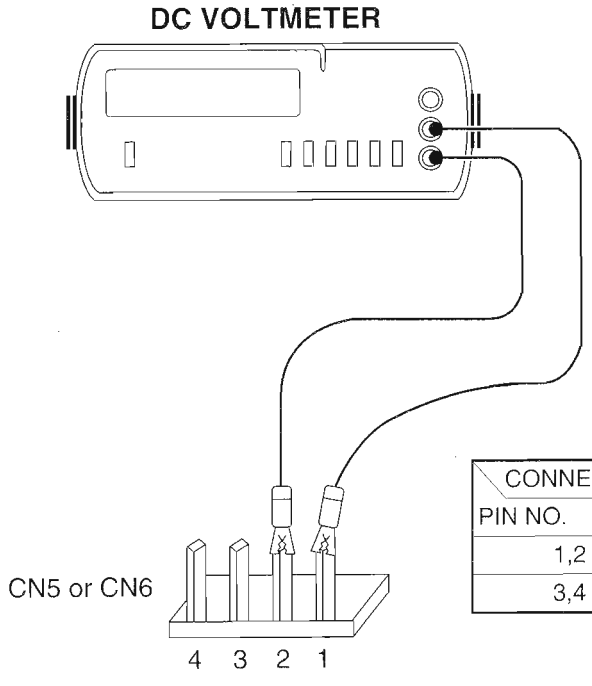
6-2. Pin connection

NO.	NAME	I/O	DESCRIPTION		
1	DESTINATION 1	I	COMPO/K's DISCRIMINATION PORT	H : COMPO	L : K's
2	POWER ON	O	POWER RELAY CONTROL TERMINAL	H : ON	L : OFF
3	COMPO CLR	O	CONTROL IC(NJU3711)CLR SIGNAL OUTPUT TERMINAL(KA-7090R)	H : ON	L : OFF
	K's NC	O	NOT USED	H : ON	L : OFF
4	COMPO REC OUT	O	"REC OUT" LED CONTROL TERMINAL (KA7090R)	H : OFF	L : ON
	K's MD MONITOR	O	"MD MONITOR" LED CONTROL TERMINAL	H : OFF	L : ON
5	MUTING-30	O	COMPO "A•T•T" LED RELAY CONTROL TERMINAL (KA-7090R)	H : OFF	L : ON
			K's "A MUTE" LED TERMINAL	H : OFF	L : ON
6	AUDIO MUTE	O	"MUTING" SIGNAL OUTPUT TERMINAL	H : ON	L : OFF
7	HEAD PHONES	O	HEAD PHONES CONTROL TERMINAL	H : ON	L : OFF
8	S DATA	I/O	SERIAL DATA		
9	S BUSY	I/O	SERIAL BUSY		
10	V DOWN	O	VOLUME DOWN SIGNAL OUTPUT TERMINAL	H : UP	L : OTHER
11	V UP	O	VOLUME UP SIGNAL OUTPUT TERMINAL	H : DOWN	L : OTHER
12	KEY (TACT)	I (A/D)	KEY INPUT TERMINAL 5 KEYS (KA-7090R)		
			KEY INPUT TERMINAL 5 KEYS (K's)		
13	SPEAKER SEL	I (A/D)	" SPEAKER SELECTOR " INPUT TERMINAL		
14	SEL IC DATA	O	SELECTOR IC DATA	H : I DATA	L : O DATA
15	SEL IC CLOCK	O	SELECTOR IC CLOCK	H : I DATA	L : O DATA
16	SEL IC ST	O	SELECTOR IC STROBE	H : I DATA	L : O DATA
17	INPUT SEL	I (A/D)	INPUT SELECTOR SW INPUT/CONTROL TERMINAL		
18	V REF	I	A/D REFERENCE VOLTAGE		
19	X IN	I	OSCILLATOR (8MHz)		
20	X OUT	O	OSCILLATOR (8MHz)		
21	VSS		GND		
22	VCC		+5V		
23	N/C	I	NOT USED		
24	$\overline{CE}$	I	MICROPROCESSOR CHIP ENABLE	H : ENABLE	
25	$\overline{RESET}$	I	RESET SIGNAL INPUT TERMINAL		
26	PROTECTION	I	PROTECTION DETECTION	H : ON	L : OFF
27	REMOCON IN	I	REMOTE CONTROL INPUT TERMINAL		
28	SOURCE.DIR B	I	COMPO → NOT USED K's ROTARY ENCODER B SIGNAL INPUT TERMINAL		
29	SOURCE.DIR A	I	COMPO → NOT USED K's ROTARY ENCODER A SIGNAL INPUT TERMINAL		
30	SP B	O	SPEAKER RELAY B CONTROL TERMINAL	H : ON	L : OFF
31	SP A	O	SPEAKER RELAY A CONTROL TERMINAL	H : ON	L : OFF
32		O	COMPO(NJU3711)CONTROL ST SIGNAL OUTPUT TERMINAL (KA-7090R)	H : OFF	L: ON
	$\overline{CD\ DIR}$		K's "CD.DIR"LED CONTROL TERMINAL	H : OFF	L : ON
33	$\overline{SOURCE\ DIR}$	O	"SOURCE.DIR"LED CONTROL TERMINAL	H : OFF	L : ON
34	$\overline{LOUDNESS}$	O	"LOUDNESS" LED CONTROL TERMINAL	H : OFF	L : ON
35	$\overline{ON/STANDBY}$	O	"ON/STANDBY" LED CONTROL TERMINAL	H : OFF	L : ON
36	$\overline{INPUT\ TAPE}$	O	"TAPE" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
37	$\overline{MD}$	O	"MD" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
38	$\overline{CD}$	O	"CD" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
39	$\overline{AUX}$	O	"AUX" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
40	$\overline{TUNER}$	O	"TUNER" LED/RELAY CONTROL TERMINAL	H: OFF	L : ON
41	$\overline{PHONO}$	O	"PHONO" LED/RELAY CONTROL TERMINAL	H : 8	L : 16
42	COMPO 8/16	I	SERIAL 8/16 BIT DISCRIMINATION TERMINAL (KA-7090R)	H : KAF-7002	L : KAF-5002
	K's DESTINATION2	I	MODEL DISCRIMINATION TERMINAL		

ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
Unless otherwise specified, the individual switches should be set as following: **POWER : ON** **SPEAKER : B** **REC OUT : OFF**							
1	IDLE CURRENT	–	Connect a DC voltmeter between CN 5 (L) CN 6(R). (X09) (A/3)	VOLUME : 0	VR1,3 (L) VR2,4 (R) (X09) (A/3)	17.6 mV	(a)

(a)



CONNECTOR / PIN NO.	CN5 (L)ch IDLE	CN6 (R)ch IDLE
1,2	Q121,123	Q122,124
3,4	Q125,127	Q126,128

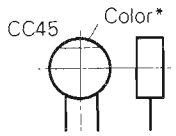
KA-7090R

PARTS DESCRIPTIONS

CAPACITORS

CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF

2 2 0 = 22pF
0 = Multiplier
2 = 2nd number
2 = 1st number

• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10μF – 10 ~ +50 Less than 4.7μF -10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	–
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	–
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	–

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)

Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

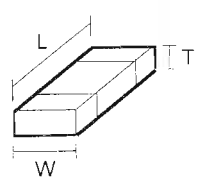
Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

• Chip resistor (Carbon)

(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B,F)

Dimension



Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6±0.2	0.8±0.2	0.5±0.1

• Carbon resistor (Normal type)

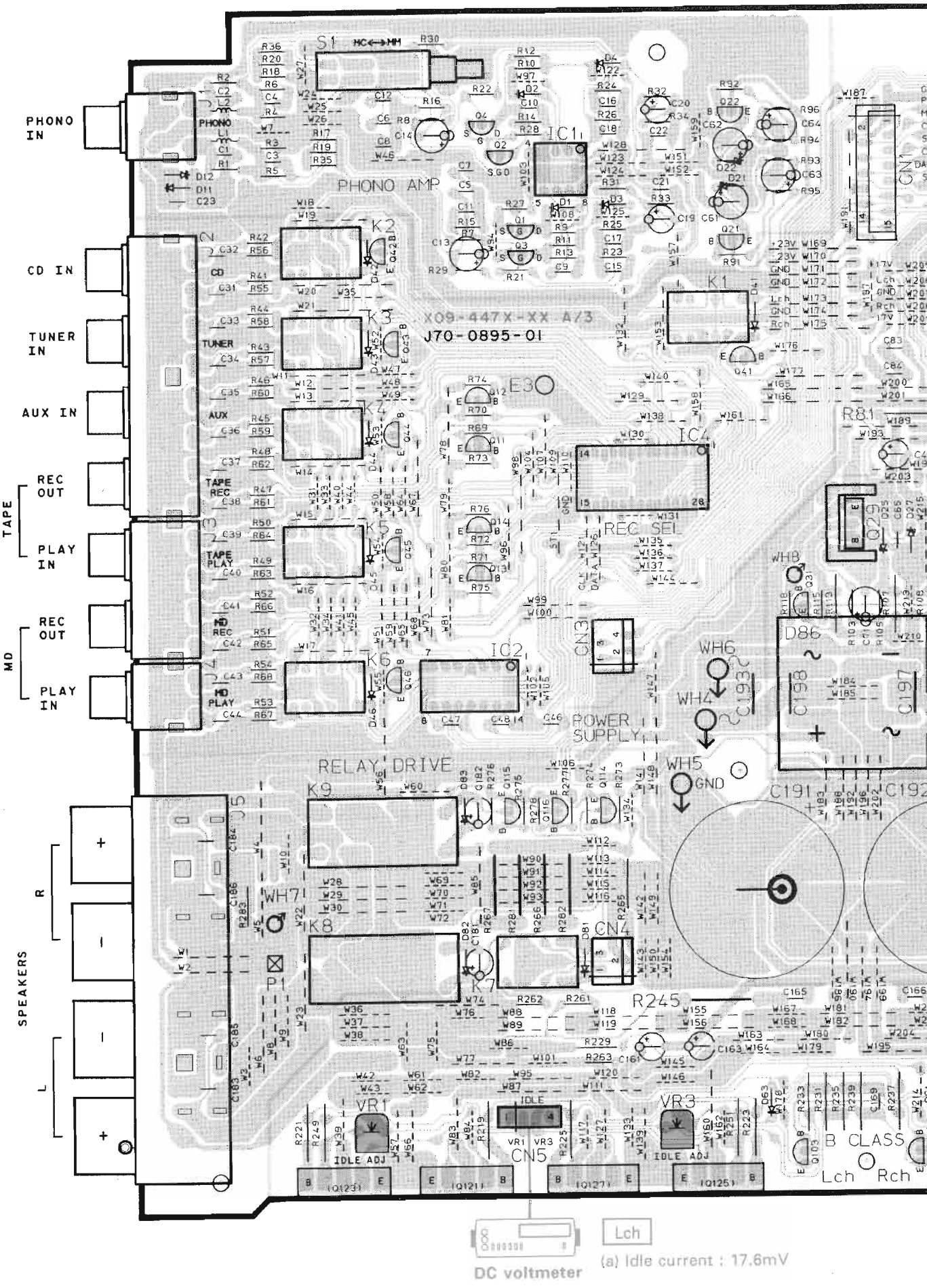
(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

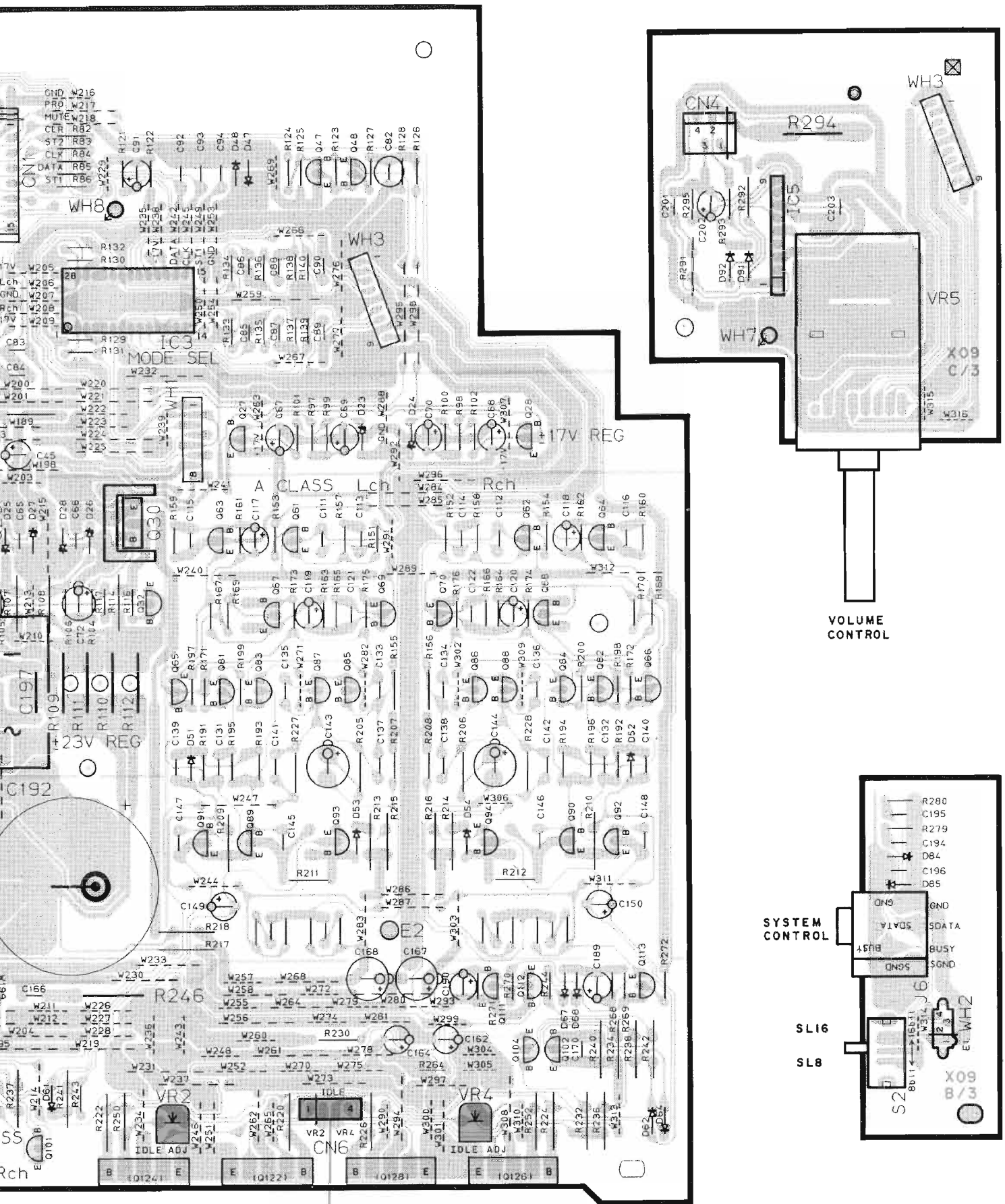
Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

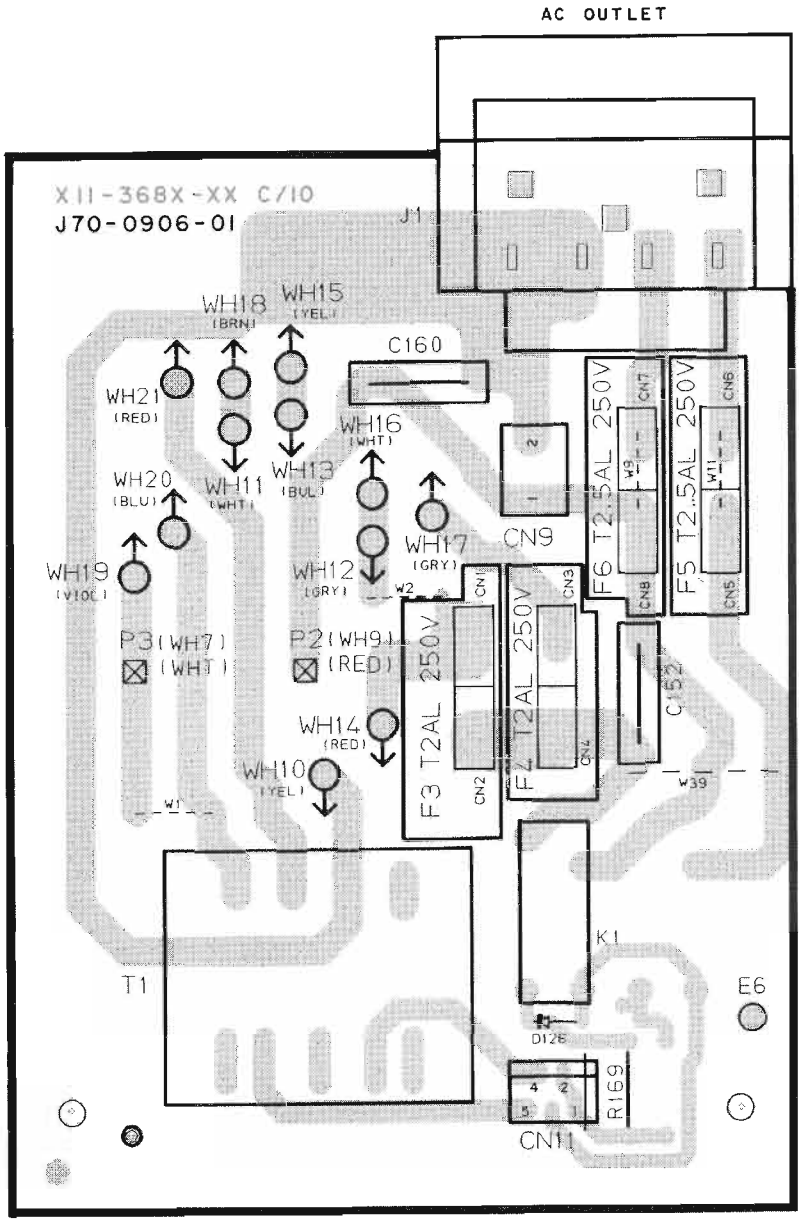
PC BOARD(COMPONENT SIDE VIEW)

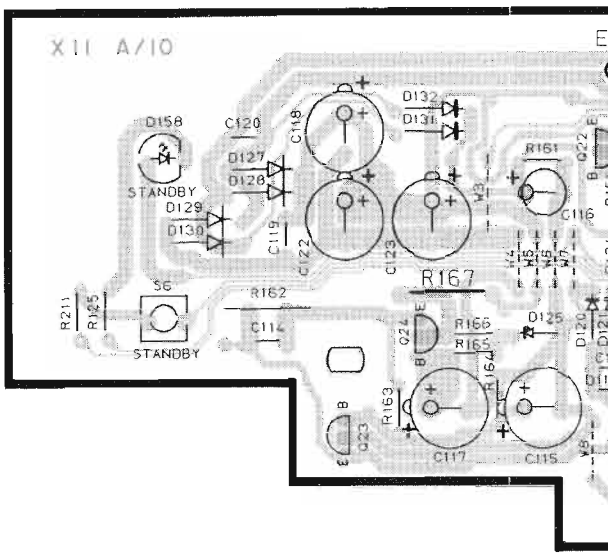


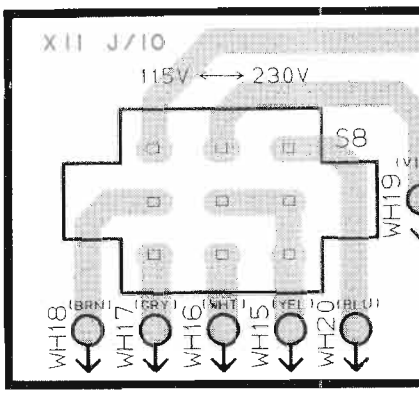
Refer to the schematic diagram for the value of resistors and capacitors.

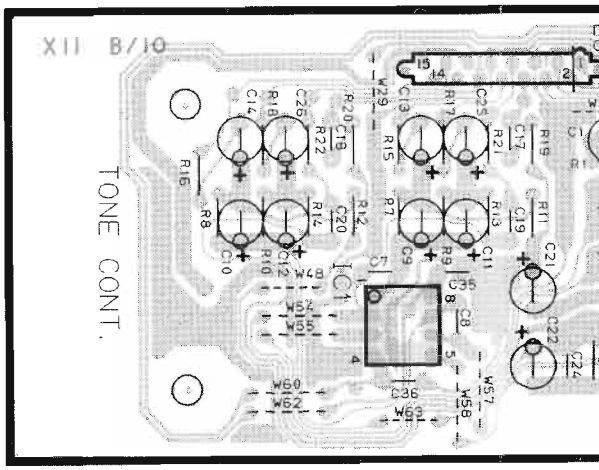

CN4
R294
WH3
IC5
VR5
WH7
X09
C/3
VOLUME
CONTROL
IC3
MODE SEL
WH1
Q30
A CLASS Lch Rch
+17V REG
+23V REG
C197
C192
R246
R230
VR2
VR4
IDLE ADJ
CN6
IDLE
SYSTEM
CONTROL
SL16
SL8
WH2
X09
B/3
S2
J6
GND
SDATA
BUSY
SGND
Rch
DC voltmeter
(a) Idle current : 17.6mV

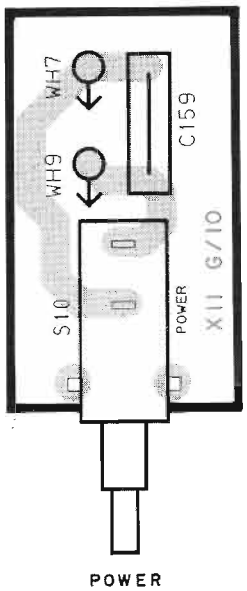
PC BOARD(COMPONENT SIDE VIEW)



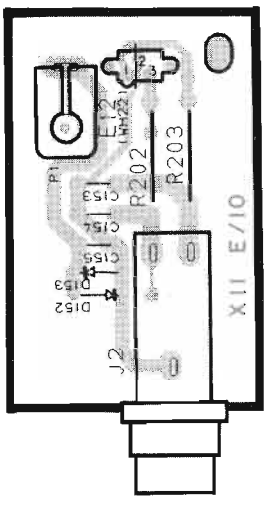




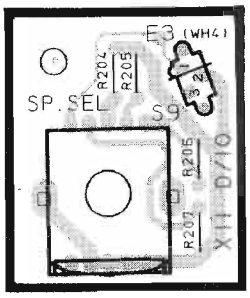




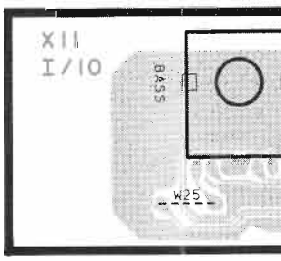
POWER

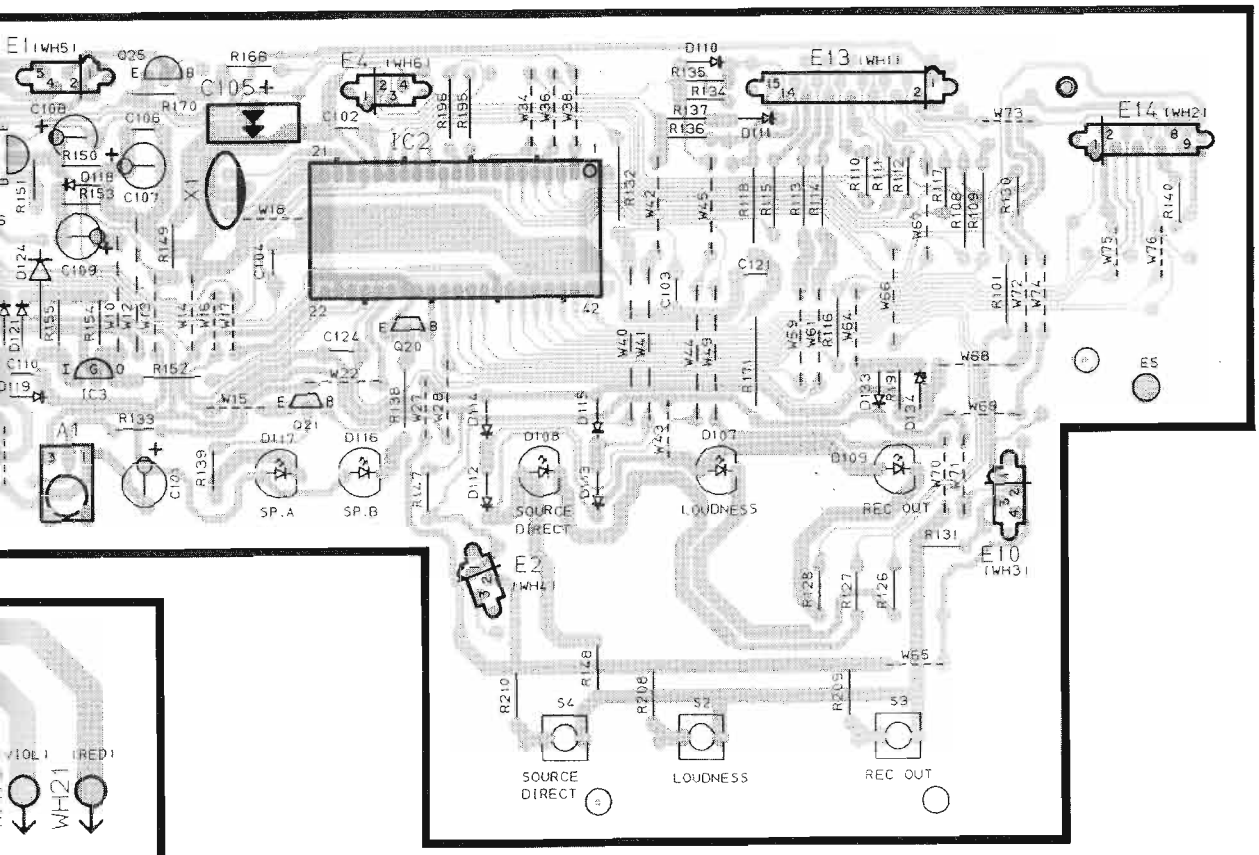


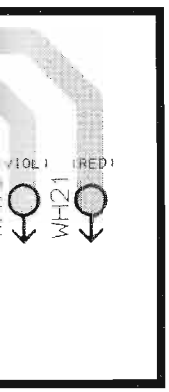
PHONES

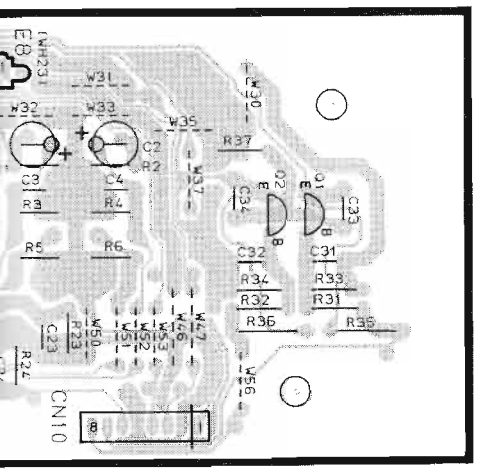


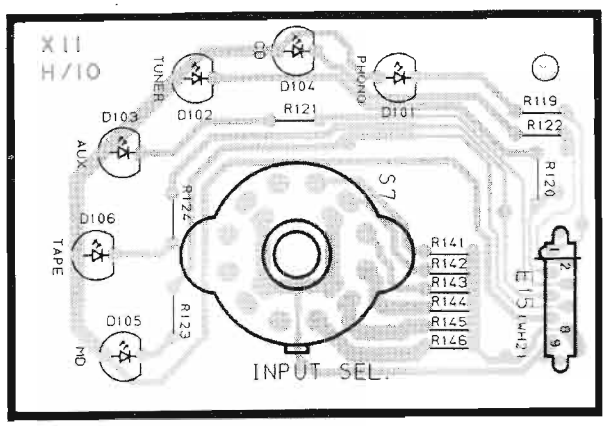
SPEAKERS

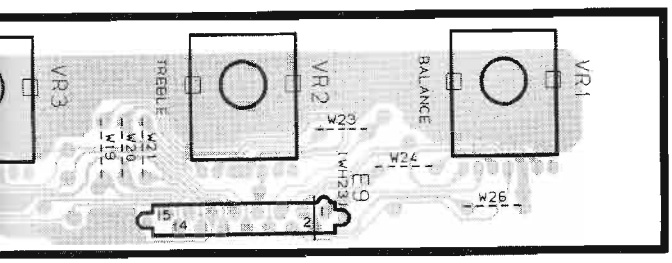


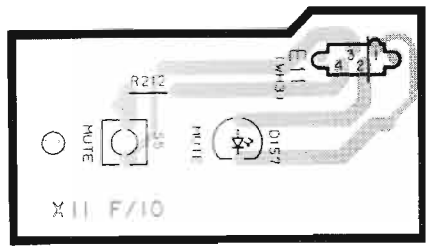




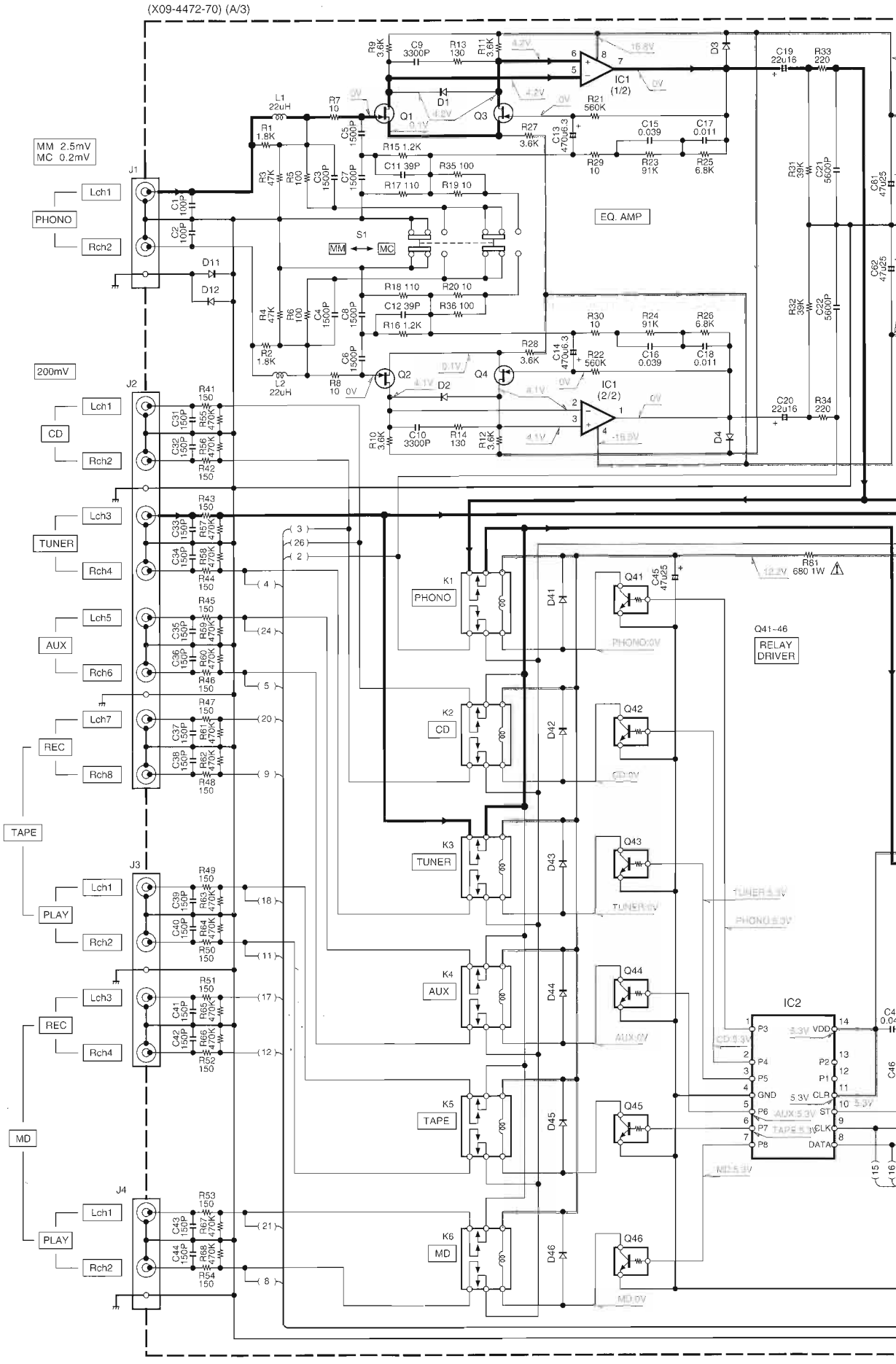


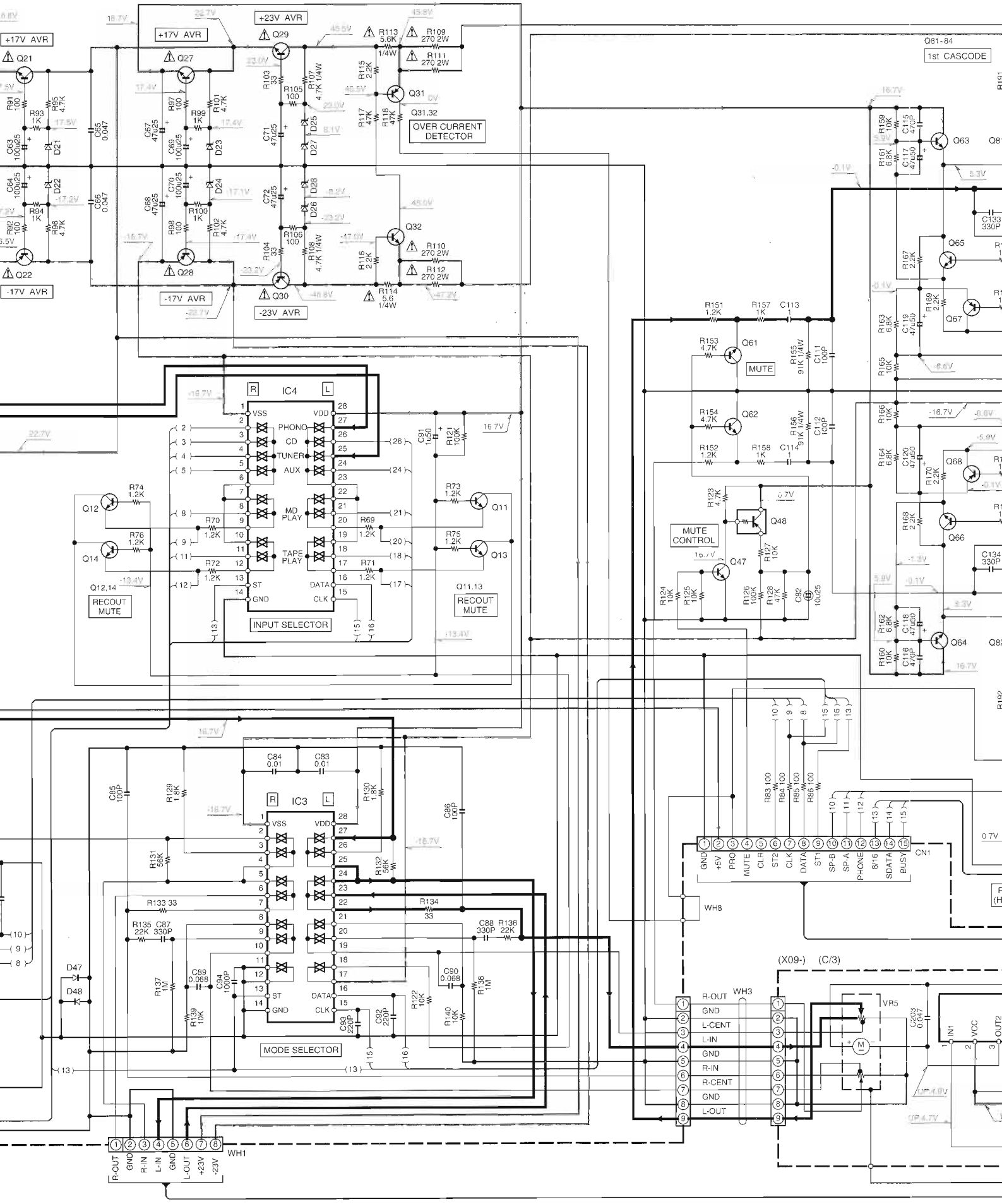


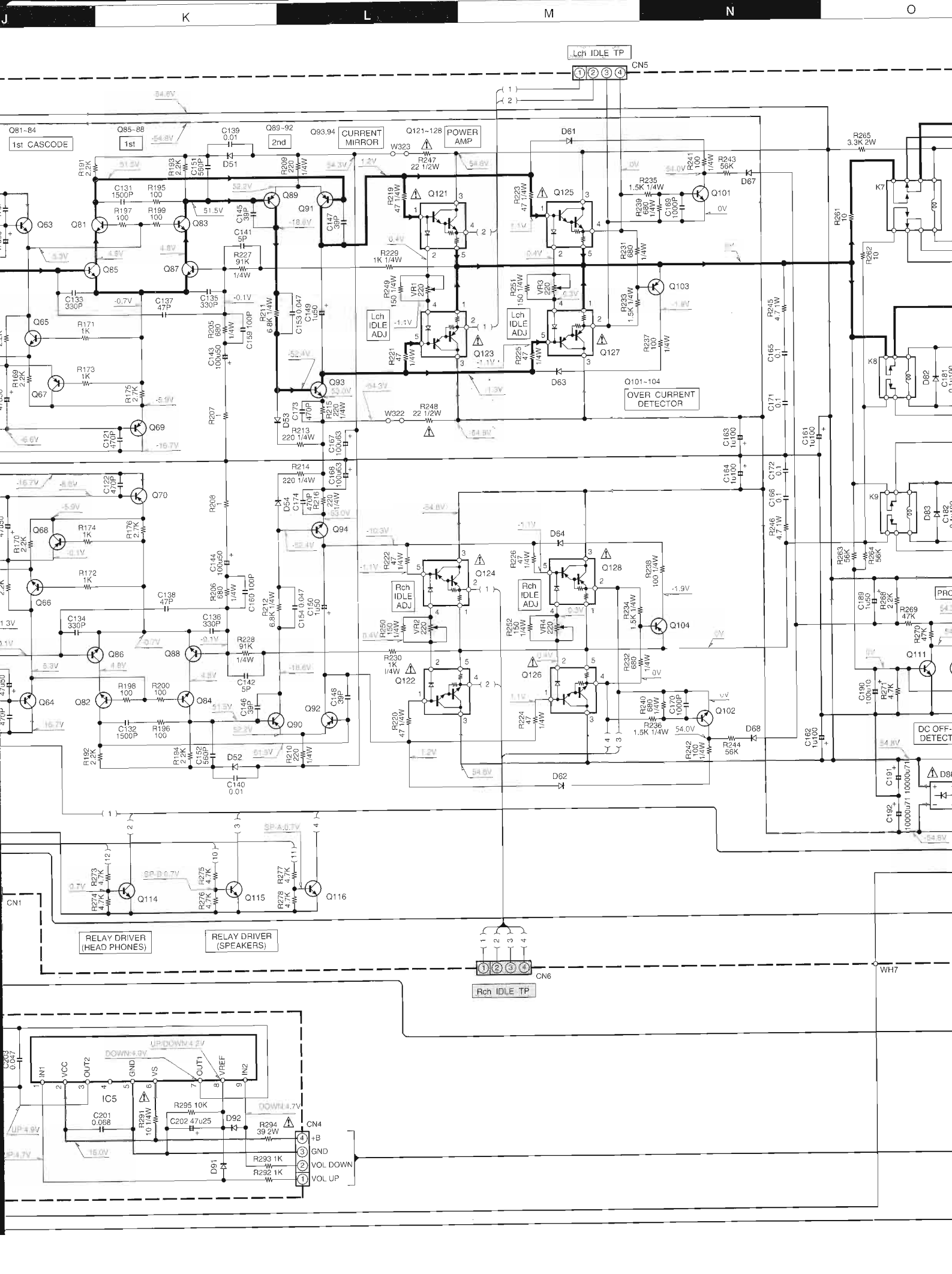


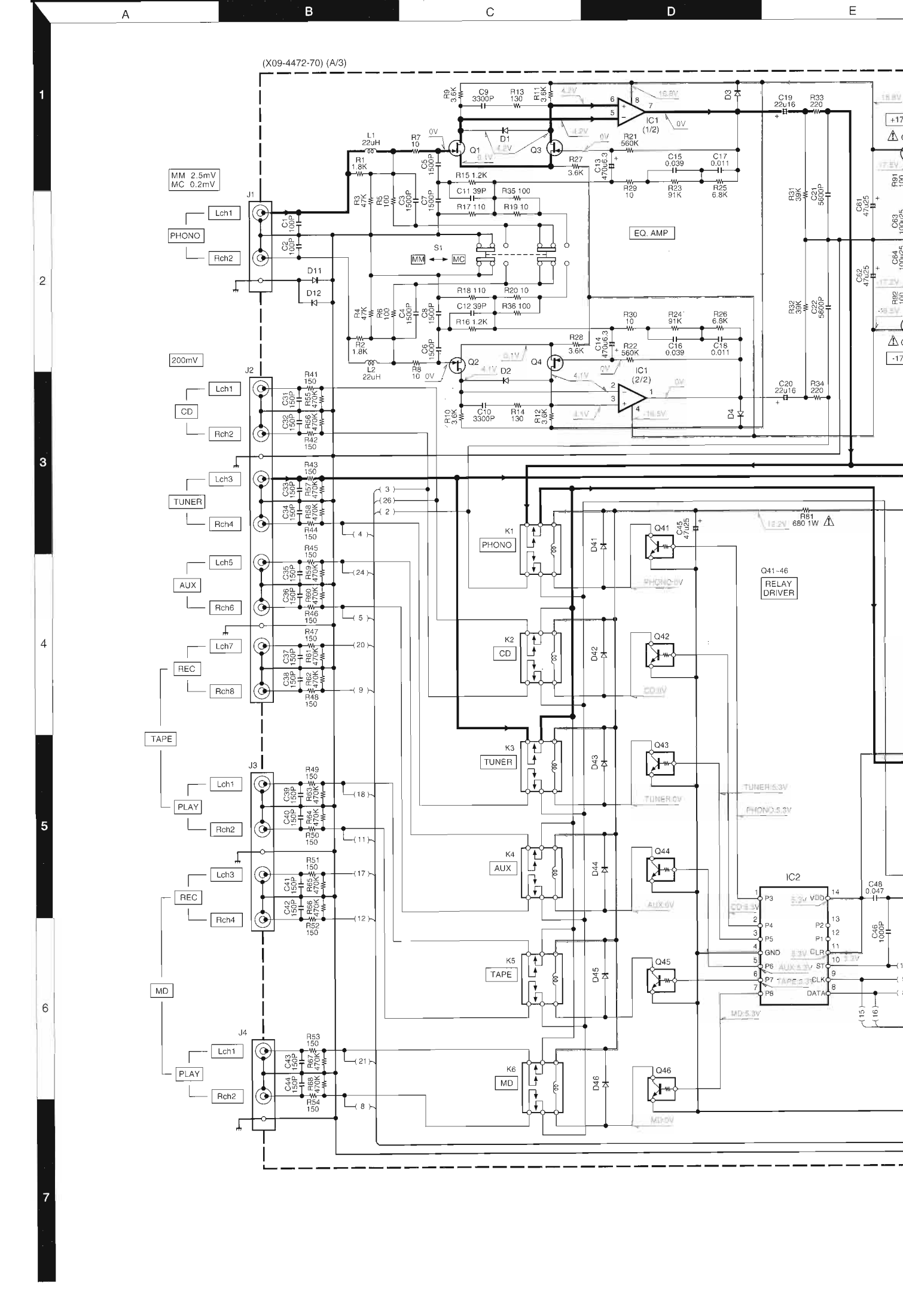


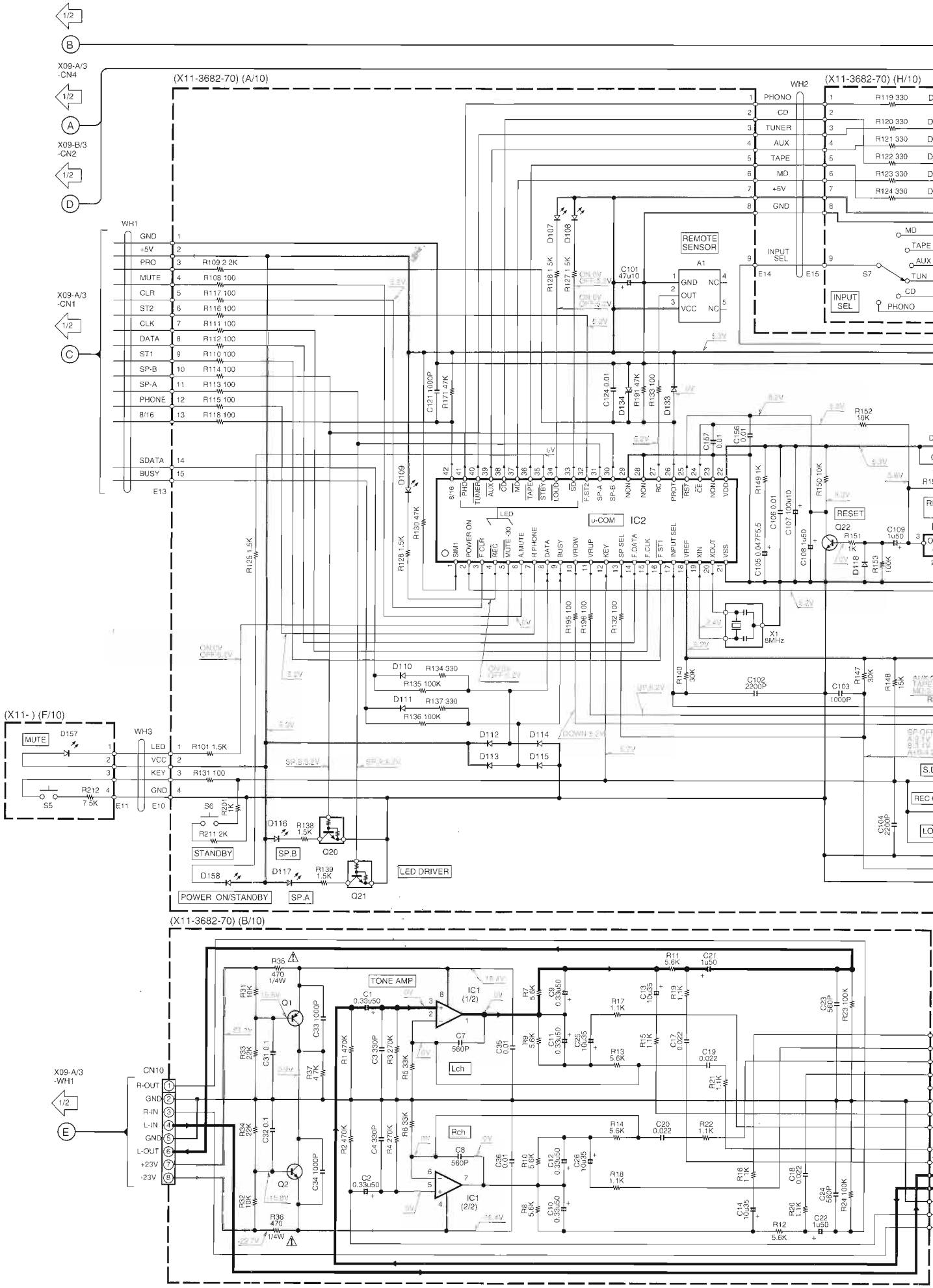
Refer to the schematic diagram for the value of resistors and capacitors.

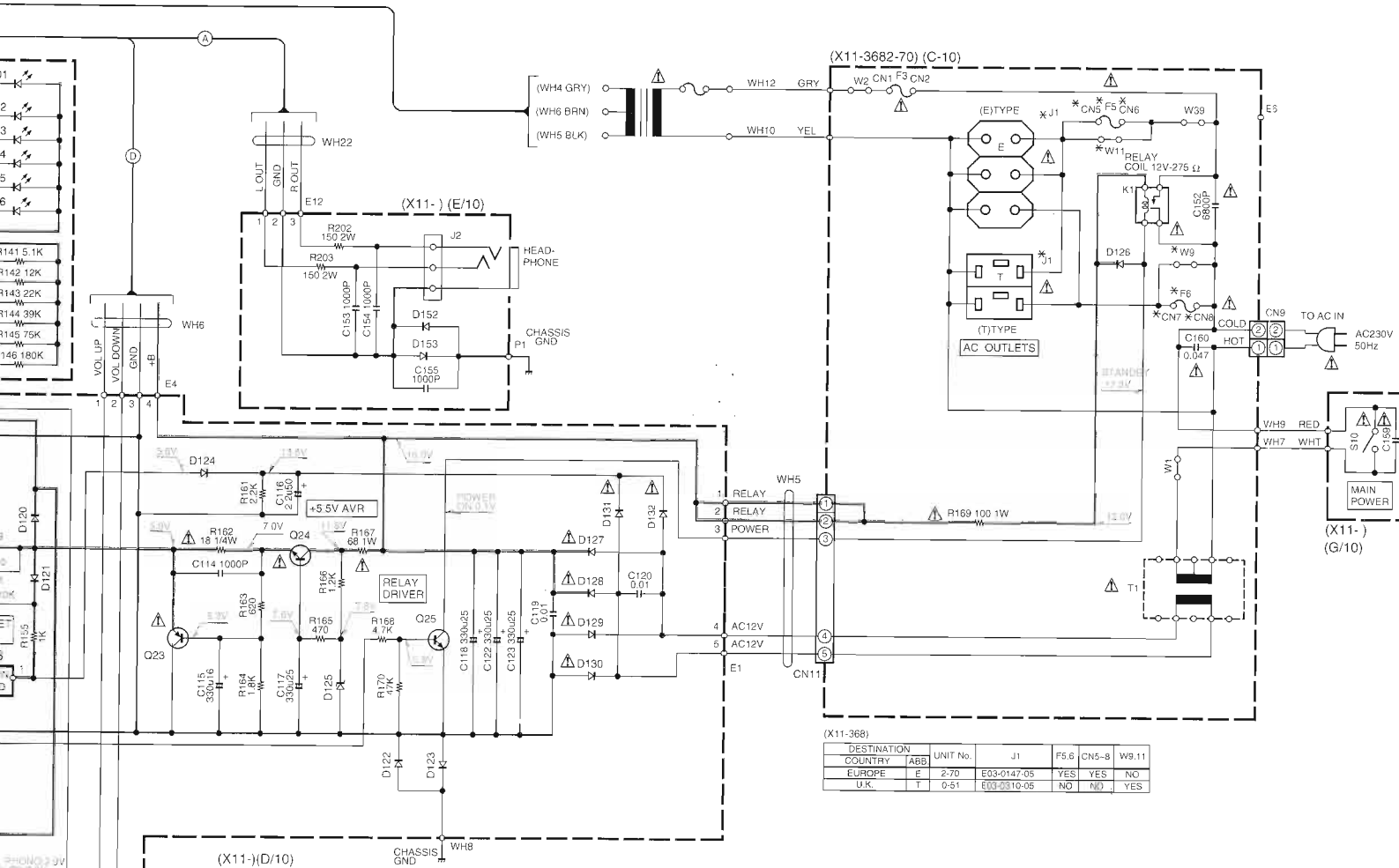

(X09-4472-70) (A/3)
MM 2.5mV
MC 0.2mV
200mV
PHONO
CD
TUNER
AUX
REC
TAPE
PLAY
MD
Lch1
Rch2
Lch3
Rch4
Lch5
Rch6
Lch7
Rch8
J1
J2
J3
J4
S1
MM
MC
EQ. AMP
IC1 (1/2)
IC1 (2/2)
IC2
K1 PHONO
K2 CD
K3 TUNER
K4 AUX
K5 TAPE
K6 MD
Q41-46
RELAY DRIVER
Q41
Q42
Q43
Q44
Q45
Q46
D41
D42
D43
D44
D45
D46
R81 680 1W
12.2V
PHONO:0V
CD:0V
TUNER:0V
AUX:0V
MD:0V
PHONO:5.3V
TUNER:5.3V
CD:5.3V
AUX:5.3V
TAPE:5.3V
MD:5.3V
5.3V VDD
5.3V CLR
GND
P1
P2
P3
P4
P5
P6
P7
P8
ST
CLK
DATA


+17V AVR
+23V AVR
-17V AVR
-23V AVR
Q21
Q22
Q27
Q28
Q29
Q30
Q31
Q31,32
Q32
OVER CURRENT DETECTOR
Q81~84
1st CASCODE
Q61
MUTE
Q62
Q63
Q64
Q65
Q66
Q67
Q68
Q47
Q48
MUTE CONTROL
IC4
INPUT SELECTOR
PHONO
CD
TUNER
AUX
MD PLAY
TAPE PLAY
VSS
VDD
DATA
CLK
ST
GND
Q12
Q14
Q11
Q13
Q12,14
Q11,13
RECOUT MUTE
IC3
MODE SELECTOR
WH1
WH3
WH8
CN1
R-OUT
GND
L-CENT
L-IN
R-IN
R-CENT
L-OUT
+23V
-23V
(X09-) (C/3)
VR5


J
K
L
M
N
O
Lch IDLE TP
CN5
Q81~84
1st CASCODE
Q85~88
1st
Q89~92
2nd
Q93,94
CURRENT MIRROR
Q121~128
POWER AMP
Q101~104
OVER CURRENT DETECTOR
Lch IDLE ADJ
Rch IDLE ADJ
Rch IDLE TP
CN6
RELAY DRIVER (HEAD PHONES)
RELAY DRIVER (SPEAKERS)
DC OFF-DETECT
IC5
CN4
+B
GND
VOL DOWN
VOL UP
WH7


(X09-4472-70) (A/3)
MM 2.5mV
MC 0.2mV
PHONO
Lch1
Rch2
J1
EQ. AMP
S1
MM
MC
200mV
CD
J2
TUNER
Lch3
Rch4
AUX
Lch5
Rch6
REC
Lch7
Rch8
TAPE
J3
PLAY
Lch1
Rch2
REC
Lch3
Rch4
MD
J4
PLAY
Lch1
Rch2
IC1 (1/2)
IC1 (2/2)
Q1
Q2
Q3
Q4
D1
D2
D3
D4
D11
D12
K1 PHONO
K2 CD
K3 TUNER
K4 AUX
K5 TAPE
K6 MD
Q41
Q42
Q43
Q44
Q45
Q46
Q41~46
RELAY
DRIVER
IC2
R81
680 1W
PHONO:5.3V
TUNER:5.3V
CD:5.3V
AUX:5.3V
TAPE:5.3V
MD:5.3V


(X11-3682-70) (A/10)
(X11-3682-70) (H/10)
(X11-3682-70) (B/10)
(X11-) (F/10)
WH1
WH2
WH3
X09-A/3 -CN4
X09-B/3 -CN2
X09-A/3 -CN1
X09-A/3 -WH1
CN10
REMOTE SENSOR
INPUT SEL
u-COM
IC2
LED
RESET
X1 8MHz
MUTE
STANDBY
POWER ON/STANDBY
SP.A
SP.B
LED DRIVER
TONE AMP
IC1 (1/2)
IC1 (2/2)
Lch
Rch
PHONO
CD
TUNER
AUX
TAPE
MD
+5V
GND
R-OUT
L-IN
R-IN
L-OUT
+23V
-23V



(X11-368)

DESTINATION		UNIT No.	J1	F5.6	CN5-8	W9.11
COUNTRY	ABB					
EUROPE	E	2-70	E03-0147-05	YES	YES	NO
U.K.	T	0-51	E03-0310-05	NO	NO	YES

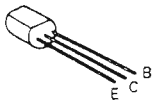
IC1	: NJM4565D-D
IC2	: M37471M4-805SP
IC3	: S-806D-Z
Q1	: 2SA954(L,K)
Q2	: 2SC2003(L,K)
Q20,21	: UN4212 or DTC124ES
Q22,25	: 2SC2458(Y,GR) or 2SC3311A(Q,R)
Q23	: 2SA1048(Y,GR) or 2SA1309A(Q,R)
Q24	: 2SC3940A(R,S) or 2SD863(E,F)
D101~109 116,117,157,158	: B30-2461-05
D110~115,118~121 124,131~133	: 1SS133 or HSS104
D125	: RD7.5JS(B) or HZS7.5S(B)
D126,152,153	: 1SS131 or HSS104A
D127~130	: S5688B or 1SR139-100
D134	: RD5.1JS(B2) or HZS5.1S(B2)

CAUTION: *For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.*

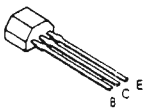
The DC voltage is an actual reading measured with a high impedance type voltmeter with no signal input. The measurement value may vary depending on the measuring instruments used or on the product.

2SA1124
2SA954
2SA992
2SC1845
2SC2003
2SC2632
2SC2878

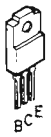
2SC3940A
2SD863



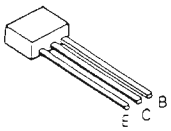
DTC124ES
UN4116
2SA1048
2SC2458



2SB1370
2SD2061

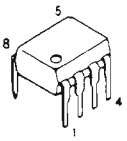


UN4212
UN4216
2SA1309A
2SC3311A

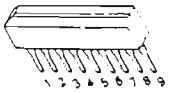


2SB1375
2SD2012

NJM4565D-D

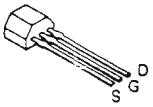


TA8409S

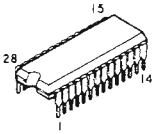


NJU3711D

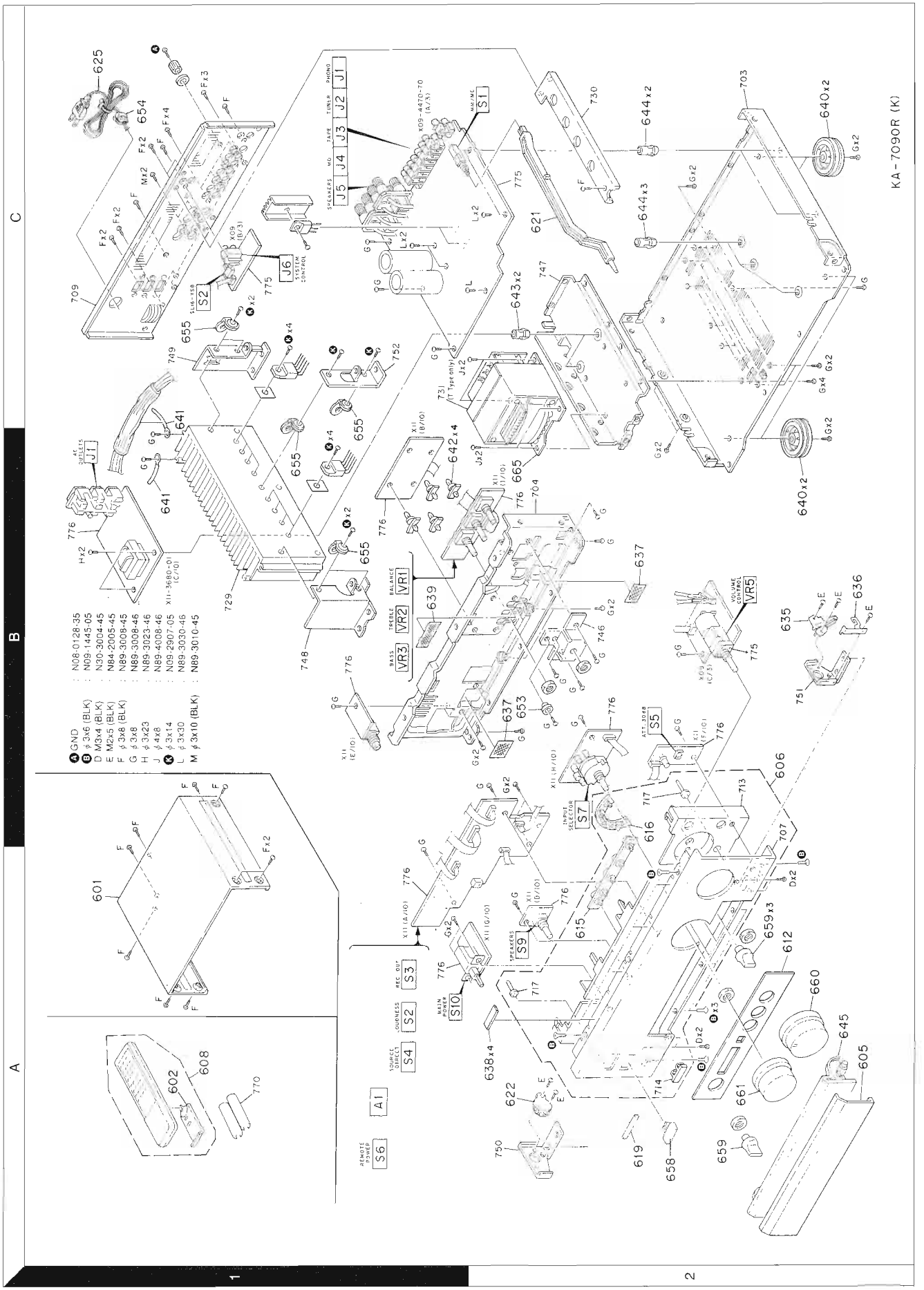
2SK371



TC9162N
TC9164N



EXPLODED VIEW (UNIT)



Parts with the exploded numbers larger than 700 are not supplied.

* New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❶

Ref. No	Address	New Parts	Parts No.	Description	Destination	Remarks
				KA-7090R		
601	1A	*	A01-3333-21	METALLIC CABINET		
602	1A		A09-0170-08	BATTERY COVER		
605	2A	*	A52-0308-03	DOOR		
606	2B	*	A60-0944-12	PANEL ASSY		
608	1A	*	A70-1079-05	REMOTE CONTROLLER ASSY		
612	2A	*	B03-2972-13	DRESSING PLATE		
615	2A	*	B12-0295-04	INDICATOR		
616	2A	*	B12-0296-04	INDICATOR		
619	2A		B43-0302-04	KENWOOD BADGE		
-			B46-0310-03	WARRANTY CARD		
-		*	B58-0965-13	CAUTION CARD	T	
-		*	B58-0966-13	CAUTION CARD	E	
-		*	B60-2805-00	INSTRUCTION MANUAL	E	
-		*	B60-2807-00	INSTRUCTION MANUAL	T	
621	2C	*	D21-1844-03	EXTENSION SHAFT		
622	2A		D39-0200-05	DAMPER		
⚠ 625	1C		E30-2788-05	AC POWER CORD	E	
⚠ 625	1C		E30-2791-05	AC POWER CORD	T	
635	2B		G02-1011-04	FLAT SPRING		
636	2B	*	G02-1601-04	FLAT SPRING		
637	2B		G10-0154-04	NON-WOVEN FABRIC		
638	2A		G11-0155-14	SOFT TAPE (40X9X2)		
639	1B		G10-0179-04	NON-WOVEN FABRIC		
-		*	H10-7211-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H10-7212-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H11-0074-04	POLYSTYRENE FOAMED BOARD		
-		*	H12-2302-04	PACKING FIXTURET		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)	E	
-			H25-0319-04	PROTECTION BAG	E	
-			H25-0651-04	PROTECTION BAG	T	
-			H25-0657-04	PROTECTION BAG	T	
-		*	H50-2036-14	ITEM CARTON CASE	E	
-		*	H50-2037-14	ITEM CARTON CASE	T	
640	2B,2C		J02-1147-13	FOOT (D=46,H=18.5)		
641	1B		J19-0306-05	LEAD HOLDER		
642	1B		J19-3325-05	UNIT HOLDER		
643	2C		J19-3690-04	UNIT HOLDER		
644	2C		J19-3730-04	UNIT HOLDER		
645	2A	*	J19-5691-12	HOLDER		
653	2B	*	J39-0198-04	SPACER		
⚠ 654	1C		J42-0083-05	POWER CORD BUSHING		
655	1B,1C	*	J42-0331-04	BUSHING		
-			J61-0098-05	WIRE BAND		
658			K27-2176-04	KNOB (BUTTON)		
659			K29-3759-14	KNOB		
660		*	K29-6390-04	KNOB		
661		*	K29-6391-04	KNOB		
⚠ 665		*	L07-2156-05	POWER TRANSFORMER		
				AUDIO (X09-4472-70)		
C1 ,2			CC45FSL1H101J	CERAMIC 100PF J		
C3 -8			CQ93FMG1H152J	MYLAR 1500PF J		

L : Scandinavia **K** : USA **P** : Canada **R** : Mexico
Y : PX(Far East, Hawaii) **T** : Europe **E** : Europe **G** : Germany
Y : AAFES(Europe) **X** : Australia **M** : Other Areas

⚠ indicates safety critical components.

* New Parts
Parts without **Parts No.** are not supplied
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❷

Ref. No	Address	New Parts	Parts No.	Description	Destination	Remarks
C9 ,10			CQ93FMG1H332J	MYLAR 3300PF J		
C11 ,12			CC45FSL1H390J	CERAMIC 39PF J		
C13 ,14			CE04KW0J471M	ELECTRO 470UF 6.3WV		
C15 ,16			CQ93FMG1H393J	MYLAR 0.039UF J		
C17 ,18			CQ93FMG1H113J	MYLAR 0.011UF J		
C19 ,20			CE04KW1C220M	ELECTRO 22UF 16WV		
C21 ,22			CQ93FMG1H562J	MYLAR 5600PF J		
C31 -44			CC45FSL1H151J	CERAMIC 150PF J		
C45			CE04KW1E470M	ELECTRO 47UF 25WV		
C46 ,47			CQ93FMG1H102J	MYLAR 1000PF J		
C48			CQ93FMG1H473J	MYLAR 0.047UF J		
C61 ,62			CE04KW1E470M	ELECTRO 47UF 25WV		
C63 ,64			CE04KW1E101M	ELECTRO 100UF 25WV		
C65 ,66			CQ93FMG1H473J	MYLAR 0.047UF J		
C67 ,68			CE04KW1E470M	ELECTRO 47UF 25WV		
C69 ,70			CE04KW1E101M	ELECTRO 100UF 25WV		
C71 ,72			CE04KW1E470M	ELECTRO 47UF 25WV		
C82			CE04HW1E100M	NP-ELEC 10UF 25WV		
C83 ,84			CQ93FMG1H103J	MYLAR 0.010UF J		
C85 ,86			CC45FSL1H101J	CERAMIC 100PF J		
C87 ,88			CC45FSL1H331J	CERAMIC 330PF J		
C89 ,90			CQ93FMG1H683J	MYLAR 0.068UF J		
C91			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C92 ,93			CC45FSL1H221J	CERAMIC 220PF J		
C94			CC45FSL1H102J	CERAMIC 1000PF J		
C111,112			CC45FSL1H101J	CERAMIC 100PF J		
C113,114		*	C91-1549-05	MF-C 1.0UF 50WV		
C115,116			CQ93FMG1H471J	MYLAR 470PF J		
C117-120			CE04KW1H470M	ELECTRO 47UF 50WV		
C121,122			CQ93FMG1H471J	MYLAR 470PF J		
C131,132			CQ93FMG1H152J	MYLAR 1500PF J		
C133-136			CC45FSL1H331J	CERAMIC 330PF J		
C137,138			CC45FSL1H470J	CERAMIC 47PF J		
C139,140			CQ93FMG1H103J	MYLAR 0.010UF J		
C141,142			CC45FSL1H050C	CERAMIC 5.0PF C		
C143,144			CE04KW1H101M	ELECTRO 100UF 50WV		
C145-148			C91-1469-05	FILM 39PF K		
C149,150			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C151,152			CC45FSL1H561J	CERAMIC 560PF J		
C153,154			CQ93FMG1H473J	MYLAR 0.047UF J		
C159,160			CC45FSL1H101J	CERAMIC 100PF J		
C161-164			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C165,166			CQ93FMG1H104J	MYLAR 0.10UF J		
C167,168			CE04DW1J101M	ELECTRO 100UF 63WV		
C169,170			CQ93FMG1H102J	MYLAR 1000PF J		
C171,172			CQ93FMG1H104J	MYLAR 0.10UF J		
C173,174			CQ93FMG1H471J	MYLAR 470PF J		
C181,182			CE04KW2A0R1M	ELECTRO 0.1UF 100WV		
C183-186			CQ93FMG1H472J	MYLAR 4700PF J		
C189			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C190			CE04KW1A101M	ELECTRO 100UF 10WV		
C191,192		*	C90-3624-05	ELECTRO 10000UF 71WV		
C193			CK45FE2H103P	CERAMIC 0.010UF P		
C194,195			CC45FSL1H221J	CERAMIC 220PF J		
C196			CK45FF1H103Z	CERAMIC 0.010UF Z		

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⚠ indicates safety critical components.

* New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❶

Ref. No	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
				KA-7090R		
601	1A	*	A01-3333-21	METALLIC CABINET		
602	1A		A09-0170-08	BATTERY COVER		
605	2A	*	A52-0308-03	DOOR		
606	2B	*	A60-0944-12	PANEL ASSY		
608	1A	*	A70-1079-05	REMOTE CONTROLLER ASSY		
612	2A	*	B03-2972-13	DRESSING PLATE		
615	2A	*	B12-0295-04	INDICATOR		
616	2A	*	B12-0296-04	INDICATOR		
619	2A		B43-0302-04	KENWOOD BADGE		
-			B46-0310-03	WARRANTY CARD		
-		*	B58-0965-13	CAUTION CARD	T	
-		*	B58-0966-13	CAUTION CARD	E	
-		*	B60-2805-00	INSTRUCTION MANUAL	E	
-		*	B60-2807-00	INSTRUCTION MANUAL	T	
621	2C	*	D21-1844-03	EXTENSION SHAFT		
622	2A		D39-0200-05	DAMPER		
⚠ 625	1C		E30-2788-05	AC POWER CORD	E	
⚠ 625	1C		E30-2791-05	AC POWER CORD	T	
635	2B		G02-1011-04	FLAT SPRING		
636	2B	*	G02-1601-04	FLAT SPRING		
637	2B		G10-0154-04	NON-WOVEN FABRIC		
638	2A		G11-0155-14	SOFT TAPE (40X9X2)		
639	1B		G10-0179-04	NON-WOVEN FABRIC		
-		*	H10-7211-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H10-7212-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H11-0074-04	POLYSTYRENE FOAMED BOARD		
-		*	H12-2302-04	PACKING FIXTURE T		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)	E	
-			H25-0319-04	PROTECTION BAG	E	
-			H25-0651-04	PROTECTION BAG	T	
-			H25-0657-04	PROTECTION BAG	T	
-		*	H50-2036-14	ITEM CARTON CASE	E	
-		*	H50-2037-14	ITEM CARTON CASE	T	
640	2B,2C		J02-1147-13	FOOT (D=46,H=18.5)		
641	1B		J19-0306-05	LEAD HOLDER		
642	1B		J19-3325-05	UNIT HOLDER		
643	2C		J19-3690-04	UNIT HOLDER		
644	2C		J19-3730-04	UNIT HOLDER		
645	2A	*	J19-5691-12	HOLDER		
653	2B	*	J39-0198-04	SPACER		
⚠ 654	1C		J42-0083-05	POWER CORD BUSHING		
655	1B,1C	*	J42-0331-04	BUSHING		
-			J61-0098-05	WIRE BAND		
658			K27-2176-04	KNOB (BUTTON)		
659			K29-3759-14	KNOB		
660		*	K29-6390-04	KNOB		
661		*	K29-6391-04	KNOB		
⚠ 665		*	L07-2156-05	POWER TRANSFORMER		
				AUDIO (X09-4472-70)		
C1 ,2			CC45FSL1H101J	CERAMIC 100PF J		
C3 -8			CQ93FMG1H152J	MYLAR 1500PF J		

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❷

Ref. No	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
C9 ,10			CQ93FMG1H332J	MYLAR 3300PF J		
C11 ,12			CC45FSL1H390J	CERAMIC 39PF J		
C13 ,14			CE04KW0J471M	ELECTRO 470UF 6.3WV		
C15 ,16			CQ93FMG1H393J	MYLAR 0.039UF J		
C17 ,18			CQ93FMG1H113J	MYLAR 0.011UF J		
C19 ,20			CE04KW1C220M	ELECTRO 22UF 16WV		
C21 ,22			CQ93FMG1H562J	MYLAR 5600PF J		
C31 -44			CC45FSL1H151J	CERAMIC 150PF J		
C45			CE04KW1E470M	ELECTRO 47UF 25WV		
C46 ,47			CQ93FMG1H102J	MYLAR 1000PF J		
C48			CQ93FMG1H473J	MYLAR 0.047UF J		
C61 ,62			CE04KW1E470M	ELECTRO 47UF 25WV		
C63 ,64			CE04KW1E101M	ELECTRO 100UF 25WV		
C65 ,66			CQ93FMG1H473J	MYLAR 0.047UF J		
C67 ,68			CE04KW1E470M	ELECTRO 47UF 25WV		
C69 ,70			CE04KW1E101M	ELECTRO 100UF 25WV		
C71 ,72			CE04KW1E470M	ELECTRO 47UF 25WV		
C82			CE04HW1E100M	NP-ELEC 10UF 25WV		
C83 ,84			CQ93FMG1H103J	MYLAR 0.010UF J		
C85 ,86			CC45FSL1H101J	CERAMIC 100PF J		
C87 ,88			CC45FSL1H331J	CERAMIC 330PF J		
C89 ,90			CQ93FMG1H683J	MYLAR 0.068UF J		
C91			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C92 ,93			CC45FSL1H221J	CERAMIC 220PF J		
C94			CC45FSL1H102J	CERAMIC 1000PF J		
C111,112			CC45FSL1H101J	CERAMIC 100PF J		
C113,114		*	C91-1549-05	MF-C 1.0UF 50WV		
C115,116			CQ93FMG1H471J	MYLAR 470PF J		
C117-120			CE04KW1H470M	ELECTRO 47UF 50WV		
C121,122			CQ93FMG1H471J	MYLAR 470PF J		
C131,132			CQ93FMG1H152J	MYLAR 1500PF J		
C133-136			CC45FSL1H331J	CERAMIC 330PF J		
C137,138			CC45FSL1H470J	CERAMIC 47PF J		
C139,140			CQ93FMG1H103J	MYLAR 0.010UF J		
C141,142			CC45FSL1H050C	CERAMIC 5.0PF C		
C143,144			CE04KW1H101M	ELECTRO 100UF 50WV		
C145-148			C91-1469-05	FILM 39PF K		
C149,150			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C151,152			CC45FSL1H561J	CERAMIC 560PF J		
C153,154			CQ93FMG1H473J	MYLAR 0.047UF J		
C159,160			CC45FSL1H101J	CERAMIC 100PF J		
C161-164			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C165,166			CQ93FMG1H104J	MYLAR 0.10UF J		
C167,168			CE04DW1J101M	ELECTRO 100UF 63WV		
C169,170			CQ93FMG1H102J	MYLAR 1000PF J		
C171,172			CQ93FMG1H104J	MYLAR 0.10UF J		
C173,174			CQ93FMG1H471J	MYLAR 470PF J		
C181,182			CE04KW2A0R1M	ELECTRO 0.1UF 100WV		
C183-186			CQ93FMG1H472J	MYLAR 4700PF J		
C189			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C190			CE04KW1A101M	ELECTRO 100UF 10WV		
C191,192		*	C90-3624-05	ELECTRO 10000UF 71WV		
C193			CK45FE2H103P	CERAMIC 0.010UF P		
C194,195			CC45FSL1H221J	CERAMIC 220PF J		
C196			CK45FF1H103Z	CERAMIC 0.010UF Z		

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SPECIFICATIONS

Continuous rated output
(DIN/IEC)
4 Ω .....150 W + 150 W
8 Ω .....90 W + 90 W
(IEC) 20 Hz to 20,000 Hz, 0.05 % T.H.D.
4 Ω .....115 W + 115 W
8 Ω .....85 W + 85 W
Total harmonic distortion
.....0.02 % (20 Hz ~ 20 kHz, 45 W, 8 Ω)
.....0.005 % (1 kHz, 45 W, 8 Ω)
Damping factor .....250 (50 Hz)
Frequency response
LINE (CD, TAPE TUNER, AUX, MD)
.....5 Hz ~ 100 kHz, +0 dB, -3 dB
PHONO 'RIAA' response ..20 Hz ~ 20 kHz, +0.3 dB, -0.3 dB
Maximum input level
PHONO (MM).....120 mV, 0.3 % T.H.D. at 1 kHz
PHONO (MC) .....10 mV, 0.3 % T.H.D. at 1 kHz
Signal to noise ratio (IHF 66')
PHONO (MM).....88 dB
PHONO (MC) .....68 dB
LINE (CD, TAPE TUNER, AUX, MD).....105 dB

TONE CONTROL
BASS.....±10 dB (100 Hz)
TREBLE.....±10 dB (10 kHz)
LOUDNESS control (VOLUME at -30 dB level)
.....+6 dB (100 Hz)
.....+3 dB (10 kHz)
Input sensitivity/impedance
PHONO (MM) .....2.5 mV/47 kΩ
PHONO (MC) .....0.2 mV/100 Ω
LINE (CD, TAPE TUNER, AUX, MD) .....200 mV/47 kΩ
Output level/impedance
TAPE REC.....200 mV/1.5 kΩ
MD REC .....200 mV/1.5 kΩ

GENERAL

Power consumption .....300 W
AC outlet
SWITCHED .....2 (total 95 W max.)
UNSWITCHED.....1 (100 W max.)
Dimensions .....W : 440 mm
H : 147 mm
D : 392 mm
Weight (net).....11.7 kg

KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

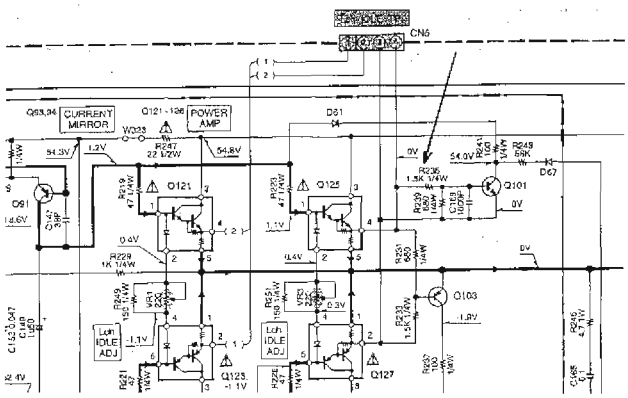
Kenwood Reparaturtip

14. mei. 99

Modell: KA-7090R

Fehler: Schutzschaltung reagiert sehr schnell, wenn 4 Ohm Lautsprecher angeschlossen sind.

Lösung: In der Schutzschaltung den Wert der beiden Widerstände R235, R236 von 1,5 K auf 2,2 k erhöhen.



Bemerkung:

KA-7090R

Note:
Component and circuity are subject to modification to insure best operation under differing local conditions. This manual is based on Europe (E) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

KENWOOD CORPORATION
14-6,Dogenzaka 1-chome, Shibuya-ku, Tokyo, 150 Japan

KENWOOD SERVICE CORPORATION
P.O BOX 22745, 2201 East Dominguez St., Long Beach, CA 90801-5745, U.S.A.

KENWOOD ELECTRONICS CANADA INC.
6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8

KENWOOD ELECTRONICS LATIN AMERICA S.A.
P.O BOX 55-2791, Piso 6 plaza Chase, Cl. 47 y Aquilino de la Guardia Panama, Republic de Panama

KENWOOD ELECTRONICS U.K. LIMITED
KENWOOD House, Dwight Road, Watford, Herts., WD1 8EB., United Kingdom

KENWOOD ELECTRONICS BENELUX N.V.
Meachelsesteenweg 418, B-1930 Zaventem, Belgium

KENWOOD ELECTRONICS DEUTSCHLAND GMBH
Rembrücker Str. 15, 63150 Heusenstamm, Germany

KENWOOD ELECTRONICS FRANCE S.A.
13 Boulevard Ney, 75018 Paris, France

KENWOOD ELECTRONICS ITALIA S.p.A.
Via G. Sirtori, 7/9 20129, Milano, Italy

KENWOOD IBÉRICA S.A.
Bolivia, 239-08020 Barcelona, Spain

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD. (A.C.N. 001499 074)
P.O Box 504, 8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140, Australia

KENWOOD & LEE ELECTRONICS, LTD.
Unit 3712-3724, Level 37, Tower 1, Metroplaza, 223 Hing Fong Road. Kwai Fong N.T., Hong Kong

KENWOOD ELECTRONICS SINGAPORE PTE LTD.
No. 1 Genting Lane #02-02, KENWOOD Building, Singapore. 349544

KENWOOD ELECTRONICS (MALAYSIA) SDN BHD.
#4.01 Level 4, Wisma Academy Lot 4A, Jalan 19/1 46300 Petaling Jaya Selangor Darul Ehsan Malaysia